00060444

BOMBAY BRANCH
OF THE
ROYAL ASIATIC SOCIETY.
TOWN HALL, BOMBAY.

Digitized with financial assistance from the
Government of Maharashtra
on 20 February, 2016

Explanations.
The Red Flags denote the Opium Factories.
The Blue Flags denote the Indego Factories.
Those with this Mark are Thannahs.
Scale of Miles.
Printed at the Govt. Lith. Press

NOTES

ON THE

MEDICAL TOPOGRAPHY

OF THE

District of Sarun.

By ROBERT RANKINE,

CIVIL ASSISTANT SURGEON.

"FUNGAR VICE COTIS."—*Hor.*

Printed by Order of Government.

CALCUTTA:

G. H. HUTTMANN, MILITARY ORPHAN PRESS.

1839.

915.412
Ran/Not
60444

00060444

To JOHN MARSHALL, Esq.,

Superintending Surgeon,

DINAPORE.

SIR,

In reply to the Circular of the Medical Board, accompanied by the letter from General Casement, C. B., Secretary to the Government of India, calling for statistical information, I have the honor to forward my notes on the Medical Topography of the district of Sarun: during a long residence in this district, (nearly twelve years), I have had many opportunities of visiting most parts in the interior of it, and such observations, as I have been able to make, I have condensed in the accompanying report.

I have had access to the different offices, but with the exception of two old reports dated 1800, and 1801, I have been unable to discover any manuscript reports or journals, on the statistics of the district; from these and two late reports, returned to the Commissioner by the officers at the station, on the state of the jail, and currency of the district, I have derived some information, which I beg to acknowledge in this place.

From our imperfect knowledge of the statistics of the country, and the circumstance of no records being kept of births, deaths, &c. I regret to say, that I have found it impossible to furnish any information on these points.

I have noticed generally those subjects, immediately explanatory of the present state of the district, and also those points connected with it, both in regard to the means that are offered for some improvements, and those that contribute to its support; but it is a difficult task to suggest any change in a district so long settled as Sarun has been, and in all probability, the remarks I have made, and the papers I have consulted, have at one time or other been submitted to Government.

Various causes have concurred to prevent my offering to the Medical Board, so circumstantial and satisfactory a report, as I could have wished; my public duties at the station, want of materials for reference, and want of a suitable establishment for research, have combined to render my desire in this respect unavailing: defective therefore as it may prove, in point of arrangement and extensive information, I still presume to submit it to the indulgent consideration of the Medical Board, and trust it may be considered as a willing, though feeble attempt to comply with the spirit of the orders of Government.

I have the honor to be,
Sir,
Your most obedient Servant,

R. RANKINE,
Civil Assistant Surgeon, Sarun.

JANUARY 22, 1838.

ON THE

MEDICAL TOPOGRAPHY

OF THE

DISTRICT OF SARUN.

Sarun, the most northern district in the province of Behar, is situated about the 26th degree of north latitude, and comprehends the district called Chumparun. To the north it is bounded by Mukwanpore, or the Nepaul Tarae, and a line of pillars, erected in 1817, point out the frontier; to the south it has the Ganges; to the east it has the district of Tirhoot,—on the west the river Dewah or Goggrah, and to the north-west it unites with the district of Goruckpore.

Boundaries.

Viewing this district, as depicted in the accompanying Sketch Map, it will be observed that the Great Gunduck river forms a complete, and natural boundary, between Sircar Sarun and Sircar Chumparun. The geographical situation of Sarun proper is rather

Sarun—its geographical situation.

singular, it forms nearly an island or more properly speaking it is a peninsula, being encompassed by three considerable rivers; the Ganges, Dewah, and Great Gunduck. In 1784, according to Major Rennell's mensuration, Sarun in both its divisions contained 5,106 square miles, of which area the particular portion distinguished by the name of Sarun comprehended 2,560 square miles, and Chumparun, in all its dimensions, 2,546 square miles. The former containing 16 pergunnahs or lesser districts, the latter 4, and comprising in both its divisions 19 large thannahs. The recorded number of towns and villages is 8,781. The extreme length of the district is about 120 miles, and its breadth about 90. The population is very considerable, and according to the most authentic accounts, it amounts to about 2,000,000, at the average rate of five individuals to a family, and the proportion the Mussulmans bear to the Hindoos, is about one-sixth of the former, to five-sixths of the latter; the number of village watchmen in Sarun alone is 6,769, and the land appropriated for their support, 3,187 beegas; the majority are paid in kind and coin, and the amount disbursed on that account annually is about 46,000 rupees.

Face of the country.

The district contains no mountains, no undulations of hill and dale, the surface is a general level, almost a dead flat from one

extremity to the other, thickly studded throughout with mangoe groves, so extensive in many places, as almost to deserve the name of forests, with intervening cultivated fields. It is intersected with numerous *nullahs*, many of which are considerable rivers in the rainy season, but during the dry season contain little or no water.

Sarun has for a long period been in the highest state of cultivation, and for its dimensions, is considered one of the most prosperous in the British dominions. In 1795 it appears to have been permanently assessed at Sa. Rs. 13,84,632 per annum ; since that period, however, the revenue has been considerably increased by annexations, reversions of estates to Government, and resumption of rent-free tenures ; I understand it now amounts to about eighteen lacks, including the abkarree, and duty on stamps. Revenue.

Sarun is too well cultivated to afford much jungle of any description, indeed there is none, with the exception of an inconsiderable portion, which extends from the frontiers of Goruckpore. Chumparun is on the whole productive, but agriculture there is still backward, and civilization less perfect ; perhaps, not more than one-third of Chumparun is under cultivation. This probably arises from its vicinity to the hills, and distance from the Sudder station : it has extensive forests containing every species of tree common in this Chumparun.

country and abounds with Saul, Sissoo, Toon, Mohow, Semul, &c.

There are also large uncultivated tracks of country in Sircar Chumparun, and the inhabitants are constantly changing, owing to the unhealthiness of the place—seldom residing more than two or three years in this part of the district; until cultivation becomes more extended, and the country better populated, the climate is not likely to become more salubrious. This part of the country is described by Hamilton, as having suffered severely during the great famine in 1770, when almost half the inhabitants are supposed to have perished.

The unhealthiness.

Rivers. The principal rivers, connected with this district, are the Ganges, Dewah, Great and Little Gunducks, there are also several considerable hill streams. The Dinouty, Bâgmâttee, and Loll Begee, in Chumparun. They all arise from the hills, by numerous streamlets, and empty themselves into the Gunduck. The Myah and Dubbua also traverse the Sarun division, in various directions, and empty themselves into the Ganges. The Great and Little Gunduck are navigable for small boats, throughout the year.

After the rains have subsided these rivers generally leave a large expanse of sand, perfectly free from deposits of an animal or vegetable description; the Gunduck not

Great Gunduck.

unfrequently changes its course, leaving its former bed dry, whilst it forms for itself a new course, which it pursues until some unaccountable cause again impels it into a fresh channel—banks of sand are thus thrown up, which prove highly injurious to the country. Previous to the formation of the new line of embankments on the Sarun side, the country in the neighbourhood of this river was frequently inundated, and the expectations of the agriculturists suddenly blasted. The Gunduck in most places is from four to five hundred yards in breadth, in the rainy season much wider, and it flows with great violence. From the spreading of the stream and sands shifting, there is much difficulty in navigating the Gunduck at all times, and in the dry season, in many places, it only affords a passage for very small boats.

Great Gunduck.

The confluence of the Gunduck with the Ganges takes place at Hajeepore, where there is an annual fair held. The fair generally happens about the beginning of November, at the full moon in *kartick*. The horse fair is held on the Sarun side of the river, at Sonepore. The number of horses exposed for sale last year was estimated at 10,000; the demand for cattle appears to increase every year, particularly for those bred in the districts under the influence of the stud. A great improvement has taken place in this description of cattle, and the native breeders find a ready

Sonepore Fair.

sale for their rejected young colts and fillies, at remunerating prices.

At this period, the natives throng in vast multitudes to both sides of the river, for the purpose of ablution, and expiation of their sins; the groves and fields in the neighbourhood are crowded in every direction, more especially those contiguous to Sonepore, which they suppose to be consecrated by the alleged visits of Hurreehur, a fakeer of the Utteet tribe, whose tomb is situated on the bank of the river; at this time also, there is a race meeting at Hajeepore, which is much frequented by the ladies and gentlemen of the neighbouring stations, and the place altogether exhibits a "gay and festive scene," whilst the fair lasts.

Hurdeeah Chour.

To the north-west of Sonepore, there is a very extensive morass or bog called the Hurdeea Chour—it runs parallel with the Gunduck river, and appears at one time to have been the bed of a considerable stream. Previous to the formation of the embankment on the Gunduck, that part of the country was subject to annual inundations, and extensive lakes were formed from the river water, which abounded with wild fowl of every description. It is now almost entirely under cultivation, a few patches of rank grass only here and there are to be seen; stagnant waters and extensive marshes however are frequently to be met with, in travelling through this district.

These *chours* are generally devoted to the culture of rice, and yield abundant crops.

Roads.

From local knowledge and enquiries, having been a resident in Sarun for nearly twelve years, and having visited most parts of it, I am of opinion, that good roads are much wanted in this district. The roads in the vicinity of the station of Chuprah are kept in repair by the Magistrate, and those in the interior by the Zeemindars. The Zeemindars consider this call on them to be unjust, and a great hardship, and they assert that it is unauthorized by any engagements, into which they have entered. The work is thus unwillingly undertaken, badly executed, and the *system* altogether attended with very bad consequences. The Zeemindar is compelled by the purwannah of the Magistrate, to see that the roads within his estate are repaired ; to carry this into effect he compels the ryotts or daily labourers on his estate, to execute the work, and I have often conversed with these poor creatures, while engaged in this forced labour, and been told by them, that they had been working for days, or weeks, without receiving one farthing of remuneration. In reply to this, it may be urged, that there are no funds for this particular purpose—that something must be done to make the roads passable, and that the Magistrate has no alternative but to call on the Zeemindars. This I believe to be indisputable. The Zeemindars assuredly are the

Bad system pursued to keep them in repair.

parties chiefly interested; still the burden falls on the poor *cotters*. It certainly would be worthy of the attention of our enlightened Government to change this state of things.

In the Shahabad District, I understand funds for this particular purpose were provided at the formation of the decennial settlement.

Suggested improvement.

Good roads being once made, I would recommend, in order to secure them from neglect and injury, that the superintendence of them be placed in the hands of some qualified uncovenanted European with a small salary, and under the immediate direction, and control of the Magistrate, or Road Committee. This superintendence might also extend to the bunds in the District.

Route to Goruckpore.

The great road from Chuprah to Goruckpore, via Derowly, is wretchedly bad; that leading to Goruckpore via Barragong is not much better, and in many places so narrow as scarcely to be passable for wheeled carriages, and besides having deep ditches on each side. On this road several bridges are much required, more particularly across the nullah at Sewan Allee Gunge, an extensive Mussulman town; a ferry boat plies here in the rains, and many accidents occur—two years ago, a boat sank in crossing, and to the best of my recollection, about ten lives were lost. These remarks also apply to the Govind Gunge and Bettiah roads. From Chuprah to the Eastward,

ward, as far as Sonepore, a distance of about thirty miles, the roads are in excellent repair, —and passable for wheeled carriages, nearly the whole year; to Cheran and Sharpoor Ghat, on the Ganges, the direct route to Patna and Dinapore, the roads are also very good. The road leading to Rewah Ghat, on the Gunduck, underwent a thorough repair about six years ago, and six excellent bridges across the different nullahs, were built by the Superintendent of Public Works, at the expense of Government. This road leads to Tirhoot, and is of considerable importance; a very little expense would keep it in good repair throughout the year. The road leading to Sutter Ghat, on the Gunduck, which is the high road to Chumparun, is hardly passable in many places, for five or six months in the year; it is of great consequence that this road should be made good, and kept in thorough repair—now that a Joint Magistrate has been established in Chumparun, (with reference to the extensive jurisdiction of Sarun,) the communication will be considerably increased; several bridges are urgently required on this road to make it passable for wheeled carriages, during the rainy season. In Chumparun the case is very different; the roads there are excellent, and kept in good and substantial repair by the Indigo Planters, at their private expense. From Meissey, the most eastern part of Chumparun, to within a few coss of Bettiah, a distance of nearly fifty miles, it is impossible

Route to Tirhoot.

Route to Chumparun.

Roads in Chumparun.

to desire better roads, indeed, as far as the influence of the Planters extends, the roads are in capital order; from Bettiah to Bhogga there is little intercourse, and the road is in many places a mere pathway covered with turf.

The Zeemindars for the most part look only to the advantages immediately to be derived from their estates, and I believe it very rarely happens, that any of them endeavour to improve their property for the benefit of their posterity: there are few instances of their making or repairing the cross roads from one village to another, and if the high roads are indifferent in many parts of Sarun, the cross roads are wholly neglected. For six months in the year, the inhabitants in most places are obliged to transport the produce of the land to the neighbouring markets, on the heads of coolies, and when it is considered that 20 seers is the utmost, a man can carry, for any distance, the disadvantages and miserable shifts, not to mention the expense they are put to, in disposing of the produce of their fields, may be easily imagined. There are few circumstances in the condition of this country which strike the observer more forcibly, than the absence of good roads, even in very considerable thoroughfares; nevertheless the Natives seem content with their lot, their hopes and aspirations appear rarely to extend beyond their actual and pressing wants.

Cross roads.

Ferry fund.

The Ferry fund of the District, amounts to between fourteen and fifteen thousand Rupees per annum: in my opinion, it could not be better applied, than in making and repairing, effectually the roads of the District; a moiety of it would afterwards with good management be sufficient to continue them in repair.

Nepaul Dâk.

I am not aware of any public Dâk, that passes through this District, with the exception of the one to Nepaul—the Dâk and supplies for the Resident of Catmandoo go direct from Patna, and pass through Chumparun to Segowly; from thence they are carried across the *Tarai*, by means of Dhangers, at all seasons, with impunity. The exemption of this class of people from the injurious effects of malaria is well known, and indeed, is considered a wonderful phenomenon, in the physiological history of the human race.

Himmalya mountains.

From all the northern parts of this District, the lower range of hills is seen very distinctly; over and beyond them, the lofty snowcapped Himmalya mountains afford a delightful prospect. These mountains are seen distinctly sometimes, from the cantonments at Dinapore, a distance of at least 150 miles; but this need hardly excite wonder, when we reflect, that Sir William Jones tells us, he saw the *Chumulary* mountains from Bhaugulpore, a distance of 244 miles, and Bruce saw mount *Ararat* from Derbhend, a distance of 240 miles.

Tanks and wells.

On the subject of tanks I have but few remarks to make; there are very few either about the Station, or, in the District, and in fact they are not much required. The principal towns throughout Sarun, and indeed throughout Behar, are situated near the banks of rivers, independent of which, they are all supplied with wells;—generally the subsoil of the District is favorable, and there

Depth of water.

are not many places where the depth of sand offers any serious obstacle to the sinking of wells; the water is found at various depths, from 30 to 60 feet in different parts; at and in the vicinity of Chuprah it is found about 30 feet from the surface. A *kutcha* well of six feet in diameter costs from eight to ten rupees, and may last for two or three years, but this much depends on the nature of the subsoils; a *pucka* well of the same size will cost from one hundred, to one hundred and twenty-five rupees, and it lasts according to the quality of the masonry, from twenty to one hundred years. The well water throughout Sarun is pure and wholesome, and is in general use; it is also used for the purpose of irrigation.

Soil.

It need hardly be observed, that in so large a District as Sarun, the nature of the soil is exceedingly varied, and its vegetable productions are consequently numerous; that it is not inauspicious, is well known. The general soil of Sarun is a mixture of fine mould and sand: near the station there is a good deal of the

bangar or clay soil, calculated for the production of gram;—the low lands in the vicinity of *nullahs*, occasionally covered with water in the rains, and fertilized by alluvial deposits, are known by the name of *khâdir*, and calculated for the production of wheat and barley; these lands are liable to occasional flood, and can be only cropped once in the season, and that during the *rabi* or spring; the higher lands consisting of a rich loamy soil, are calculated for sugar-cane—these lands (except where sugar-cane is planted) are frequently cropped twice and three times a year. In Chumparun the soil is for the most part alluvial; it retains its moisture well, and is particularly favorable for the production of indigo —by the sketch map which accompanies this detail, it will be seen that the indigo factories are very numerous, in this part of the District, and in general they seem to be thriving. Indigo.

The natives have an endless variety of names for the different quality of soils, almost all bearing different names, in different pergunnahs.

The District produces no mines or minerals of any description, that I am acquainted with; the country is so level, and open as to completely discourage every idea of mineral discovery—its fertility is all on the surface.

In the neighbourhood of villages, where the poppy is usually sown, irrigation from wells Irrigation.

is general throughout Sarun, and the end is obtained by the most laborious means; the machines in use for this purpose are of different kinds, the most common where the water is of a moderate depth is the *dhenklee;* it consists of two posts or pillars of wood, or of mud and bamboos about six feet in height, and about three feet apart, with a horizontal piece of wood extending from top to top, to which is suspended a long slender lever, formed of bamboos, having at one end a weight, chiefly composed of mud, and at the other, a long piece of rope, to which a conical shaped vessel, called a *khooree*, is attached. There is another machine called a *doen*, used where it is only necessary to raise the water a few feet, it resembles a very small canoe, to each end, of which a cord is tied, this is worked by two men, who holding two of the cords throw up the water.

Machines employed for

In the process of irrigation the land is divided into small squares, by ridges of earth, or into furrows, and the water running along a narrow gutter, is admitted into these squares or furrows. In the gardens about the station the *mōt* is commonly used.

Many of the high lands, where artificial irrigation is resorted to, produce three crops every year; first the summer, or *bhadoo* crop, consisting of millet, maize and different kinds of esculent plants;—second, the autumnal or khurreef crop, consisting of Indian corn,

Agriculture.

kodoo, &c.—thirdly, the spring or rubbee crop, consisting of wheat, barley, peas, gram and various other kinds of grain, of the liguminous kind. No manure of any description is applied to the soil, except perhaps to a few beegas close to villages, or occasionally to a sugar-cane field, nothing but a good, deep soil and a favorable climate, could stand the constant and various calls made on it; in unfavorable seasons, however, there is no doubt, that much of the failure of crops is owing to a want of heart in the soil.

Agricultural pursuits form the chief occupation of the inhabitants of this District, and they are allowed by the best judges to be excellent cultivators. The produce consists of wheat, barley, oats, rice, gram, maizes, peas, Indian corn, and other grain of the culmiferous and liguminous kinds; poppy, cotton, hemp are also cultivated, for which the soil is well calculated, as also for the culture of every description of esculent plant—oil seeds of different kinds, such as the castor, mustard, linseed, teel and poppy seeds, form articles of commerce, and of late years have been in great demand. Productions.

The vegetation is rapid, and the produce sufficiently abundant for home consumption, and for large exportations of wheat, barley, cotton, hemp and tobacco, chiefly for the markets of the lower Provinces. Exportations.

Commerce and manufacture.

Commerce and manufacture have not been so much attended to, the former being limitted and restricted to the productions of the soil, in its natural state.

Manufactures.

The manufactures consist of opium, indigo, saltpetre, khari-noon, or (bitter salt,) sugar and coarse cloth; the first is a declared monopoly in the hands of Government, and is committed to the supervision of an Uncovenanted Deputy and Native Agents, established by the authority, to whose department they respectively appertain.

Opium.

The cultivation of the poppy is very extensive, and in both divisions of this District it amounts to upwards of 50,000 beegas. The poppy lands are prepared in October, and sown in November and December, while the moisture is in the soil; throughout Sarun irrigation is indispensable; in Chumparun, where the soil retains its moisture much longer, it is seldom used or indeed required, but, I believe the produce from the irrigated fields is greater. The drug is prepared by those, who promote the culture of the plant.

In a favorable season the poppy in Sircars Sarun and Chumparun averages from four to five seers of opium to the beega, but in the rich lands near villages, it frequently produces eight or nine seers per beega. The papaver album, is considered the best kind

and is, with few exceptions, the kind from which the opium is obtained. The quantity supplied from this District last year amounted to about 8,000 maunds, and in point of quality I believe, it is equal to any manufactured in the Province of Behar.

The culture of opium is very profitable to the growers, when they have good produce, and should the quality be not equal to the expectations of the Agent, it is never thrown on their hands, but a percentage I believe is levied upon it.

Indigo.

The quantity of Indigo furnished by this District, on an average of season, amounts to upwards of 10,000 maunds, nine-tenths of which are cultivated in Chumparun.

Saltpetre.

The District produces saltpetre in great abundance; there is scarcely a village in either Sarun or Chumparun, that has not got its small saltpetre factory: the quantity produced annually is estimated at 200,000 maunds, and its price is generally from four to five rupees per maund. The extensive wastes in Chumparun abound in nitre, and other kinds of saline matter, such as sulphate and muriate of soda. Mr. Stephenson, a practical chemist, and late Superintendent of the Hon'ble Company's saltpetre factories in Behar, published a valuable Treatise on the manufacture in 1835. The section of this work, which treats of the "development of saltpetre" is interest-

ing to the general reader, and is applicable to many parts of Chumparun: he says—"In "the northern parts of Tirhoot bordering on "Nepaul, are extensive sterile wastes, that "develope saltpetre in abundance, as well as "other kinds of saline matter, such as sul- "phate of soda, which is always most abun- "dant, and what is called *reha muttee* by the "Natives, from the efflorescence of which they "manufacture a salt called *karry noon*. This "saline matter lies in patches of various ex- "tent, and may be known from the barren "appearance of the surface of the ground, "which from the very circumstances of the "soil containing a redundancy of these salts, "is rendered unproductive for the growth of "vegetable matter, and consequently is not "cultivated by the Ryots or native farmers. "These patches occasionally contain a redun- "dancy of saltpetre: sometimes sulphate and "muriate of soda are most predominant, but "in all, a mixture of the above salts is always "to be found."

Development of saltpetre.

"During the rainy season, when large tracts of this country are laid under water, by the rains and river floods, solutions of these salts come in contact with each other; some are decomposed, and new combinations are formed, and consequently new salts produced from these combinations. When the rains have ceased, the dry season has commenced, and the atmospherical evaporation is in full force, the redundant moisture quickly dis-

appears. Then the saline matter, (and of course saltpetre,) developes itself, most frequently in the form of a white florescence on the surface of the ground. Thus nature keeps operating in her grand laboratory, decomposing, recombining, and reproducing, from season to season, and from year to year, and thus she will proceed, alternately creating, preserving, and destroying, to the end of time." "The karry noon or sulphate of soda, is found in almost inexhaustible abundance, during the dry season in this District, and forms a considerable native article of commerce, it is given to cattle as a medicine, and used in the process of dressing, and preparing raw hides, it is a very cheap article, it sells from 12 annas, to one rupee per maund."

Karrynoon or sulphate of soda.

It may not be out of place here to mention another kind of salt, muriate of soda, which is manufactured in this District in great abundance, and used for culinary purposes, amongst the poorer classes—it is obtained in the process of making the nitrate of potash—it sells at about one rupee per maund, and is mixed with the imported salt, called *pungah*, by the retailers, in the proportion of five seers to the maund; the weight used is 80 siccas to the seer.

Culinary salt.

The annual importation of salt into this District I am informed, has hitherto averaged 150,000 maunds, and the retail selling price is about five rupees per maund. That there is

Imported salt. a considerable quantity of illicit salt introduced into the District, I believe there is no doubt, principally from the westward; the respectable salt dealers state, that this illicit trade is extensively pursued at the junction of this District with Ghazeepore and Goruckpore. This salt is eagerly purchased at 2 rupees per maund, and retailed I believe at the same price as the salt imported from the eastward.

An absurd report has lately obtained amongst the natives, that the imported salt in a state of solution deposited a sediment resembling pounded bones, and an idea got abroad, that the bones of cows, &c. had actually been mixed with the salt. As may easily be supposed this ridiculous story has excited a prejudice against the use of the article, amongst a large class of the community,—the Hindoos fearing that the use of the salt would injure their caste declined to purchase it, and the prejudice has been so general, for the last twelve months, as seriously to affect the demand and value of this commodity.

Sugar. The manufacture of sugar has rapidly increased in this District, within these last few years, and the demand seems to keep pace with the increase; it may therefore be considered as one of its valuable staple commodities. In a report furnished to Government, by the Collector in 1814, the estimated quantity of sugar manufactured in this District was

1,000 maunds; last year, I understand the exports amounted to near 50,000 maunds. The best description of sugar is manufactured in the western part of the District, near Bhoggah; it sells at the rate of nine or ten rupees per maund, of 95 siccas or tolas to the seer.

Silk.

The introduction of the silkworm was tried last year experimentally by a Mr. Zeigler, an intelligent and enterprising indigo planter in this District, and he informs me that it has fully answered his expectations, and that he intends to increase his establishment. I believe this is the first attempt, that has been made to introduce the silkworm into northern Behar.

On reviewing the productions, and taking an estimate of the wealth drawn entirely from the soil, I think the District of Sarun will be found to be a valuable possession. The most valuable possessions in India, I believe, are still considered those near the sea.

Towns.

Chuprah, the Civil Station of Sarun, is a town of little breadth, but extending for about a mile or more along the left proper bank of the Ganges, the stream of which recedes in August or September, and leaves a large expanse of sand partly bare and dry, and partly covered with shallow sheets of water. It is situated in latitude 25° 46′ North, longitude 84° 46′ East, 30 miles W. N. W. from Patna, and 24 miles from Dinapore. The

Station. station is easy of approach at all seasons; during the rains a considerable nullah runs close to the town, and the communication by water would be most materially improved, could it be kept open throughout the year; from October till July it is closed. The Dewah, a large and rapid river, unites with the Ganges at Revelgunge, about a mile above the head of the nullah, and the sands are constantly changing. There would be many difficulties to surmount in establishing this communication by the nullah, during the whole year, and perhaps an Engineer Officer could alone be a competent judge of the practicability of effecting this desirable object; while the *nullah* is open, it affords a passage for every description of boat. In the dry season, the Ganges does not approach nearer, than about two miles from the station.

Approach by water.

To the east, Chuprah unites with another considerable town called Sahibgunge. This town again joins Gobingunge, and Gobingunge unites with Cheraud and Dooregunge; from the river they resemble one long straggling Town, extending from Dooregunge to Revelgunge, a distance of fourteen miles.

Suburbs.

Our predecessors, the Dutch, appear to have had a considerable establishment at Chuprah, about the beginning of last century,—a large saltpetre factory is still in existence, which they established, and which was worked by

Dutch Factories.

the Hon'ble Company's Agent, till within these few years.

The Dutch factors' houses are yet standing, near the middle of the town, but rather in a dilapidated state—in the burying ground also, there are several tombs built in the native style—a large one bearing the inscription of some initials and A. D. 1712—it has thus stood the pelting of the *storm*, for one hundred and twenty-five years, without visible repairs of any description, and is now in excellent condition, with scarcely a brick out of its place, no bad proof of the goodness of the workmanship, and superior quality of the materials.

Level.

If a careful survey were made of Chuprah, I am inclined to think, its level would be fixed a very few feet above the river. During the rains when the *nullah* is full, the road to the eastward of the town leading to Patna is frequently under water, and on several occasions I have known houses in the town carried away by the floods; the river rises so high at times, that it was found necessary, a few years ago, to build a floodgate to the eastward of the town, at the mouth of a ditch, which opens into the nullah, to prevent the station from being inundated; on several occasions, when the water has risen higher than usual, and the floodgate has been neglected to be shut, I have seen the river water suddenly fill all the ditches, about the station,

Sluice gate.

and obstruct the roads. Chuprah is a small station; with the exception of the public offices, there are only four puckah dwelling houses, and as many bungalows, for the accommodation of the residents.

Houses.

Building materials.

Materials for building are reasonable, and at Revelgunge, which is only six miles from the station, every description of wood is procurable—it is brought from the Goruckpore District, down the river *Raptee*, and other streams, during the rains; besides wood, Revelgunge is a great mart for country produce of every description.

Lime.

Shell lime is procurable in considerable abundance, the land shells are found in the *chowers*, and collected by the women and children; it is sold at the rate of from 30 to 35 rupees per 100 maunds. Lime is also procured from the *kankar*, which is found in every direction about Chuprah: this substance besides affording a building cement, is very useful for road making: 100 parts yield upwards of 70 parts of the carbonate of lime.

Population of Chuprah.

The town of Chuprah contains about 8,700 families, which, at five individuals to a family, give a population of 43,500.

Like most of the towns in Behar, the houses are so huddled together, and the streets so confined, that it is impossible to reduce them

to any regular order; there is only one street, called the Burrah Bazar, where a buggy or hackery can pass, and that, with some difficulty; the other streets are so narrow, as to render a passage through them on an elephant, or in a palanqueen almost impracticable; fortunately the station is separated from this scene of confusion and filth—an European may reside all his life at the station of Chuprah, and see nothing of the town, unless he chooses. The houses, (with the exception of a few belonging to mahajuns, and the wealthier classes,) consist of mud walls, and tiled roofs. —About forty years ago, an order was issued by the Magistrate of Sarun, that all houses in the town and its vicinity should be tiled, since which period scarcely a fire has occurred;—were orders of this kind strictly enforced, I am convinced fires would seldom happen, and the benefits that would accrue from the security of property, &c. are obvious. The inhabitants of this town have experienced the beneficial results of the measure, which is entirely to be ascribed to the orders having been impartially and rigidly enforced. The houses of the baboos are generally brick built, in the form of a square, with very small windows, and verandahs inwards.

Houses and streets.

From the town, the bank slopes towards the dry bed of the nullah, which is always during the dry season covered with ordure, and animal filth of every description. The smell diffused in the air, in this part of the town, is

most intolerably offensive to passengers. *The* work of the scavenger is left almost entirely to the unclean beast of the field, and the fowls of the air, till the annual return of the floods.

Neglect of ventilation.

It is to be regretted, that large towns are not built with some regard to ventilation, cleanliness and regularity; perhaps the authority of the Magistrate cannot be interposed in native arrangements of this kind, without risk, but projects to improve the city of Calcutta are every day carried into effect.

The greatest improvement that could be made, is the widening of the streets; this would tend greatly to promote the general health of the inhabitants, renew and purify the confined atmosphere, render conflagrations less destructive, and check the generation of those myriads of insects, which constantly annoy the inhabitants.

The lawgivers of the east have strictly inculcated the ablution of the body, but entirely neglected to enforce the necessity of a free circulation of air in the habitations of the natives in this, albeit, one of the hottest, climates in the world.

Goadnah.

Goadnah, Revelgunge, and Simmurreah are all a continuation of the same town, the latter extends along the Dewah; at this place there is a large annual fair held, at the same time, as that at Hajeepore; a great multitude meet for

the purpose of ablution at the junction of the Dewah with the Ganges; at this period and for the space of three or four days the district appears almost drained of its population. These fairs present a very good sample of the manners and amusements of the lower orders, and in some respects resemble similar sights in England.

Annual Fair at Revelgunge.

These festivals seem to do away with, for the time, most of the distinctions of caste, and the separation of the sexes. Booths are erected on either side of the street, formed for the occasion, on the banks or dry bed of the river, to display with better effect the articles for sale; "there may be seen silks, cloths, dried fruits, and other productions of Cashmeer, and Persia, and the several manufactures of India; as in England also, may be viewed all sorts of amusements calculated to please youth, toys of every description are exposed for sale, dolls, the squeaking trumpet, the tinsel sword and gun; kings and queens innumerable may be bought decked in gorgeous array, only differing from those exhibited at an English fair, in their being composed of sugar, instead of ginger bread. At one place a bear or other wild beast become domesticated is to be seen, whilst the facetious and mischievous monkey, riding on a goat by way of a charger, is always present where fun is to be looked for; jugglers, nautches, puppet shows, and the attractive ups and downs, and round abouts, filled with boys and girls

laughing, as they ascend the air, in their little swinging boxes, are met with on all sides."

Missionaries.

In the midst of this scene may be seen one or two zealous missionaries expounding the Christian religion, surrounded by a number of clowns with open mouths, who do not understand one word that is said, and who are probably attracted merely by the hope of gain, one or two converted natives always accompany these well meaning missionaries; but I fear they have assumed a name, and a creed of which they are perfectly ignorant. It is not necessary here to enter into an enquiry, regarding the success of the missionaries in the work of conversion at these fairs; they have a different task to effect with the Hindoo, who, like "Shylock will not eat with us, will not drink with us, much less pray with us," whom we offend daily by killing the animal, he holds most sacred, and by eating of the bodies, into which the souls of his progenitors have transmigrated.

Manjee.

Manjee is a considerable town situated a little above the confluence of the Dewah with the Ganges, about twelve miles from Chuprah; near this place is a remarkable Burr tree, of which the following are the dimensions, as given by W. Hamilton—"diameter from 363 to 376 feet, circumference of the shadow at noon 1,116 feet. Circumference of the several stems, fifty or sixty in number, 921 feet." Since the above measurement was taken in

1820, the tree has considerably increased in its dimensions, and it now occupies about five beegas of land.

Sewan, or Alleegunge, is also a considerable town, situated about 36 miles from Chuprah; its population is principally composed of Mussulmans. In this vicinity, a sort of crockery is made in imitation of Staffordshire ware, from a species of black potter's marl; a considerable traffic intercourse is carried on, between this town and Goruckpore. Sewan.

Bettiah.—This town stands about 70 miles from Chuprah, W. N. W.; it is the seat of Rajah Annund Kishwar Sing. A Roman Catholic Priest resides there, and in the vicinity, there are three villages of native Christians,—Padre Leon is the present vicar. The tenure of these villages is Lākheraj, and it is held, by a *Sunnud* from the Governor General in Council, dated 1784, the proceeds being devoted to the repairs and lighting of the Churches, of which there are two, to the support of poor Christians, and to the repairs of the Padre's house. A sum of money varying in different years, between one-third and one-sixth of the proceeds of the villages is appropriated to the support of the Padre. Bettiah. Native Christians.

The establishment is a branch of a mission located at Agra, in direct communication with a society at Rome, whence the principals are supplied. The number of Christians amounts

to about 1200, and the lands held by the Padre exceed 800 beegas.

Soogouly. Soogouly stands on the south side of the little Gunduck river, and is the place from whence the Nepaul Dâk starts, on its way across the Tarai; this town, and Bettiah are both in Chumparun.

There are many other towns in the districts, not requiring particular notice.

Villages. The villages in the interior of the district are much neater, than those of Bengal; the houses are all mud walled, with thatched roofs—each village is surrounded by small fields, nicely cultivated, producing tobacco, sugar cane, mustard and castor seed.

Public buildings. Public buildings—with the exception of two brick-built houses, and a circuit bungalow used as public offices, the jail and hospital, there are no public buildings of any description at Chuprah.

Gardens. The houses at this station are well supplied with gardens; the produce consists of every kind of vegetable in great abundance, and all the variety of country fruits; the English apple, strawberry, and the vine are also to be found in most of the gardens; the flavour of the apple is equal to any I ever tasted in England, and many of them are, of a very respectable size—measuring seven, eight

and nine inches in circumference. I recollect one season, that a single tree produced one hundred and thirty.

Population.

The population of this district I have estimated at 200,000; but it is difficult to form a correct judgment of the population of a large district, where no registers of births, and deaths, are kept; this census therefore can only be looked upon as an approximation to the truth. In 1801 when the Marquis of Wellesley issued his statistical enquiries, the Judge and Collector each returned their estimates of the population, which agreed in giving an aggregate of 1,200,000, as the total number of the inhabitants; since that period, a great increase to the population has taken place.

Mode adopted for ascertaining the population.

My estimate is grounded on reports furnished by the different thannadars, specifying the number of villages in each thanna, the number of houses in each village, and taking the average rate of five individuals to each house;—but there is much difficulty in obtaining accurate returns—the natives having a great aversion to investigations of this description; the ratio the males bear to the females I am unable to state, it is almost impossible to get correct returns of the female members of families, particularly among the Mahomedans.

With the exception of three Christian villages, and a few European settlers, the popula-

Computed proportion of Hindoos and Moossulmans.

tion consists exclusively of Hindoos and Moosulmans, and the proportion is computed, (by the most intelligent natives I have conversed with,) at six of the former, to one of the latter; nearly all the principal Zeemindars, and influential natives are either Brahmins or Rajpoots;—Baboo Chutturdharee Sahee lately created a Rajah, Rajah Annund Kishwur Sing, and the Ramnuggur Rajah are the most extensive land-holders.

Inhabitants.

The great mass of the inhabitants are cultivators of the soil, and compared with Bengal the race of men are much fairer, taller, and more robust, but morally, and intellectually, I believe there is little difference; about Chuprah there are likewise many expert mechanics, blacksmiths, and carpenters in particular.

Women.

The better class of women belonging to this part of the country are seldom seen by Europeans, excepting at the great fairs; when young, they are very fair and comely, the girls wear a very small ring in their noses, called the *bolack*, which is removed, when they arrive at the age of puberty, it bears the same explanation as the *silken snood*, formerly worn by the Scotch girls, till they became brides.

Futteh Sahee irruption.

Since the time of the celebrated rebel Futteh Sah, (about 50 or 60 years ago), the inhabitants of this district have continued well disposed, and firm in their adherence to

the British Government. Futteh Sahee's history is too well known to need recapitulation here; from his retreat in the jungles bordering the Goruckpore frontier, he made frequent incursions into this district, and gave Government much trouble; he died from fever, caught in the jungles, and on his death taking place, his followers dispersed. The estates and title are now enjoyed by his grand nephew *Maha Rajah Chutturdharee Sahee*, a highly respectable, and much respected man, commanding wealth, and proportionate influence.

A regiment of native infantry was stationed for a considerable time after the death of Futteh Sah, at Burragong, a large town about fifty-six miles west of Chuprah, where several of the officers' houses are still standing.

Burragong cantonments.

Judging from the great number of old mud forts scattered throughout this district, its inhabitants at one period must have been a very warlike race, almost every considerable village having the remains of a fort or castle; these were probably built, when the Maharattas were in the habit of levying their contributions every year; but the Zeemindars too, in former times, decided all their quarrels, and boundary disputes with the sword, and even now, there is a little of the old leaven left, they are still fond of an appeal to the sword and club: aggravated affrays attended with bloodshed have not been unfrequent, and loss

Warlike character of the inhabitants.

of life was a very common occurrence, some years ago,—much more so than at the present time; the activity of the police, and judicious measures of the authorities at the station have greatly reduced these fatal quarrels.

A great number of recruits for the native army are drawn from Sarun—I have at different times seen a native officer marching through the station, with thirty or forty recruits, all fine, tall, athletic young men: the Mussulmans I believe are the most enterprising: the Hindoos prefer to walk in the ways, and to follow the occupations of their fathers; —but the love of his native soil is said to be inherent in man, and this feeling is strongly exemplified in the Hindoos—I have known many tempting offers made by the grantees, in the neighbouring district of Goruckpore, to get the poorer classes to settle on their grants, without success—there are very few instances indeed of their migrating, but from necessity.

Their aversion to migration.

The public service seems to hold out the only inducement, and this preference cannot be attributed to their patriotic feelings, although they possess every thing worth defending in a country, freedom of employment, the participation of equal laws, liberty of person, security of property, and the uncontrolled exercise of religious worship.

Recruits for the public service.

The great majority of the inferior Zeemindars in this district, from various causes

Inferior Zeemindars.

have fallen into extreme poverty;—many of them are little better than mere peasants;—the minute sub-division of property, their proneness to litigation, the extortions practised on them by the mahajuns, to whom they are almost all deeply indebted, their own imprudence—expenses incurred at marriages, and festivals, have all concurred to bring them to a condition very little removed from beggary. Their poverty.

The labouring classes have not the means of improving their situation; they seem to work, merely with a view to enable themselves, and their families to live, and when they are employed, their labor is not very amply rewarded—when they do receive a little money they are generally idle till it is spent: hunger seems to be the only stimulus to their efforts of industry—coolies or daily labourers, receive about three half-pence or two pence per day, according to the work they are employed on; women receive about one penny per day; —among the natives it is customary to pay them partly in kind, and partly in coin, but I understand, they are not so well paid by their own countrymen, as when employed by Europeans. Labouring classes. Wages of labor.

It is a very common practice with natives, to lend a rupee to a daily labourer, and to receive as interest, one day's labour, every month, which will amount at the end of the year to very little less than 75 per cent.; an- Extortion practised on the poor.

other very common practice is, for a Zeemindar to lend a maund of grain, at the sowing time, to a poor ryott, and receive one maund and a half for every maund lent. This wretched state of poverty however is no bar to their marrying, and it seldom prevents a man from having a family of children: as soon as a child is weaned, it eats rice like its parent, goes naked for two or three years, and requires little care.

Labouring classes near Indigo Factories.

In the neighbourhood of the large Indigo Factories in Chumparun, where some thousands of the labouring classes are always employed, they are observed to be more comfortable, better fed and clothed, than elsewhere. I can vouch from my own knowledge of the fact, that many thousands of these poor creatures have this year been daily fed by the Planters, who were necessitated to import from Purneah large quantities of rice for the purpose, the rice crop in the Tarai last year having been almost a total failure. In the northern parts of this district the inhabitants almost entirely depend on their supply of rice from the Tarai, and in a favorable season, it is procured at a very cheap rate, 4 or 5 maunds for the rupee; but in such a season as this last, (only $2\frac{9}{10}$ inches of rain having fallen in ten months), when a scanty spring crop succeeded, the failure of their chief dependence, the rice crop, they have in many places, been on the verge of famine; when such a calamity occurs, very few except in the neighbourhood of

Cause of scarcity.

Indigo Factories are able to get work, they leave their houses, and being destitute of the means of living by industry, they are driven to subsist by begging, or by stealing, and when sickness is added to their poverty, they have nothing to depend on, but the precarious maintenance, or voluntary contributions of their neighbours.

State of the poor.

The cause of this poverty is intimately connected with the system of oppression, which exists amongst themselves, or lies in the relation, in which they stand to the soil, (which is the chief source of their subsistence), and their complete dependence on the Zeemindars. They are rackrented by the *Ticcadars*, or *Khutkinedars*, and many of the ryotts are mere cutters, whose labour in seed time, and harvest, is at the disposal of the Assamese, for the consideration of a hut, and a beegga or two of land.

Cause of poverty.

The class of mere labourers, who work for hire, is not very numerous.

The chief employment of the women, in doors, is carding and spinning of wool or cotton, for the purpose of making coarse cloth, for the use of their families.

Employment of the women.

When oppressed with sickness, or old age, and unable to work, there is a lamentable degree of distress amongst the poorer classes, they have no asylum, no poor house, no refuge for the destitute, no hospital, and they

lie on the cold ground, with little to cover them, until relieved from their miseries.

In seasons of scarcity the distress amongst the poor.

The European community, not in this district in particular, but throughout the country, know little, and in fact, have few opportunities of knowing the extent of physical suffering, among the native population in the interior, particularly in such a season of scarcity and sickness, as that which we have lately experienced; policy as well as humanity would seem to demand, that some organized plan should be adopted, in every district to ascertain the state of the poor, and to judge of the possibility of affording relief. Such a measure would eminently become a benevolent Government.

Schools and hospitals.

No schools have hitherto been established for the instruction of the natives, nor is there any hospital for the sick poor at the station of Sarun; with the aid of Government and the contributions of the community, I should think, both schools and hospitals might be easily instituted. The majority of the inhabitants are grossly ignorant, and it would be worthy of an enlightened Government to make some effort to diffuse education amongst the lower classes, and thereby produce a higher state of civilization amongst a class of people, standing much in need of improvement.

Want of hospitals.

The want of an hospital, for the reception of the sick poor, I have often had to deplore;

many of the inhabitants, with chronic diseases or requiring operations to be performed on them, come from the interior for medical advice. Some of them travel perhaps 40 or 50 miles;—the little money they bring with them is soon spent, and they are forced to return before a cure is effected, and while under medical advice, they not unfrequently are obliged to live under the trees about the Station. No doubt the same observations, on the state and circumstances of the people here, will apply with equal force to hundreds of other places, that could be mentioned—but I should hope, and trust, that the extensive population in Chuprah and its vicinity, the great number of poor and sick, who visit the station for medical advice, and the total want of native practitioners of any repute, will operate as legitimate grounds to entitle the inhabitants to some consideration.

Comparative comfort of the Burmese.

While on service with the expedition in Ava, during the late war, I was forcibly struck, not only with the superior comfort enjoyed by the lower classes in their dwellings, but the superior intelligence and physical qualities of the inhabitants, contrasted with this country.

In the numerous towns and villages, the Army passed through, on its long march from Rangoon to Prome, I do not recollect a single village or house, in which the poorest inhabitants lived, that had not the floor raised a

few feet from the ground, and this was the case, even on the high banks of the Irawaddy. In many situations, in that country however, it must be confessed, that this construction of building is essentially necessary, on account of the heavy rains, and sudden inundations from the river. The Burmese are gross and uncleanly in their food, compared with many castes of natives in Hindoostan; but they are a much finer race of men, they are more athletic, more active, and of a much more lively disposition, the poor are better fed and clothed, and the greater number can read, and write the vulgar tongue.

Moral character and state of civilization.

In the present state of civilization in this country, which according to a late writer is only to be compared to the state of Europe, in the feudal ages, it would be unfair to judge of the moral character, manners, and habits of the people, by our own standard. The division of the community into castes, and the climate operate, it has been said, as an insuperable barrier to improvement, by confining every individual to that sphere of life and action, in which he happens to be born. In the large towns, much profligacy, vice, and depravity are to be found, but in the interior, where debauchery and dissipation are less known, the people live more industrious and virtuous lives, and fewer depredations are committed on the public. Thefts or burglaries are very seldom committed on the property of Europeans, notwithstanding the temptations, to which the

natives are exposed, and the little precaution taken towards their prevention. In a season of scarcity, such as this last has been, grain stealing has been very common—I believe nine-tenths of the vices and crimes of the people to proceed from their poverty, ignorance and superstition, and it can hardly be expected, that they will grow much richer or wiser, in the present state of things: Mr. McCulloch says, "a poor people are never "refined, nor a rich people barbarous; it is "impossible to name a single nation, which "has made any distinguished figure in philo- "sophy or the fine arts, without being at the "same time celebrated for its wealth; the "age of Pericles and Phidias was the flou- "rishing age of the Grecians, as the age of "Petrarch and Raphael was of Italian com- "merce."

Much might be said on the subject of the moral character of the natives, but it is not my intention to enter into the discussion here. Examples are not wanting, amongst the educated Hindoos in Calcutta, to prove, that their minds, when unshackled by caste, are susceptible of the best feelings, and to shew farther what may be expected from the introduction of European example, learning and science, among the mass of Indian society.

Habits of the natives.

The indolence and apathy of the Hindoos, the inartificial and natural style they live in, as far as regards their houses, furniture, &c.

their proneness to litigation are all matters of history, as also their diet, and their partial enjoyment of the necessaries of life, for what we understand by the comforts of life, they know but little of; in the interior parts of the country, they all approach much nearer to one standard in character, manners, and habits, than in almost any other country in the world.

Tobacco.

Tobacco is in general use amongst them; at seven or eight years of age they commence smoking the herb, and some castes eat it; it affords the poor man a cheap and sober refreshment, and probably often restrains him from less innocent indulgencies. Drunkenness is exceedingly common among the lower classes and castes, and is a vice, when once acquired, they scarcely ever leave off. The *Daroo*, a spirit distilled from the ripe petals of the Mowah tree mixed with *goor*, is the spirit generally drank, and is most injurious to the health of the lower orders. The higher castes consider drunkenness disgraceful, and although some of them are addicted to the vice, I believe it to be very rare, and always kept as secret as possible.

Drunkenness.

Use of Opium.

The use of opium is very common, but the proportion of those devoted to its use is not so great, as those who indulge in habitual drunkenness; the opium eater is called *affeemee*, and I am not aware, that any particular reproach or obloquy is attached to the appellation; this is perhaps owing to its being applicable to

many of the higher classes. It is always taken in its crude state, at first the dose is about a grain, but the *affeemee* soon finds it necessary to increase it to sixty times that weight: he generally takes the dose at night, and while under its influence, he is perfectly happy, his mind is tranquilized and cheerful, and his head clear. I know several Zeemindars, who transact all their business at night, while under the influence of the narcotic. In the morning the loss of the accustomed stimulus is felt, pain in the limbs, languor, yawning, suffused and watery eyes, and if deprived of it altogether, a total want of sleep are the usual consequences.

Much in use amongst the higher classes.

Among the Thug prisoners in the Chuprah jail, the habit of eating opium is almost universal; out of about 140 of these prisoners now in the jail, I feel certain there are not more than 18 or 20 exempt from the habit; from not being able to procure a sufficient supply of the drug, many of them have suffered severely from loss of appetite, bowel complaint, and insanity. Ganja and the leaves and capsules of the hemp plant have long been used by the natives, and are frequently mixed with the hookah tobacco, to increase its exhilarating and intoxicating effects.

Also amongst the Thug prisoners.

Ganja.

Tea is getting more into use than it formerly was, among those who can afford to purchase it, but their method of using it appears strange to an European taste: after it is

Tea.

infused, they mix a little salt, ghee, cardamum seed, and cloves with it, and then drink it off; they use it chiefly in the cold weather, at other seasons they think it too heating.

Amusements. The natives have no mental amusements, and are too indolent to practise gymnastics of any kind, that I am aware of; in this respect, and many others, they differ widely from the Burmese, who are very fond of wrestling, foot ball, &c. The chief amusement among all classes seems to be singing and the natch, and even these seem to produce very little excitement. Fishing is a favourite amusement with them, and seems to suit their temperament better, than any other kind of sport.

Gambling. Gambling—this ruinous vice I believe is carried to a great extent, in most of the large towns; among the higher classes it prostitutes every principle of honor and virtue, and among the lower, the necessary consequences are idleness, theft, and debauchery.

Seasons. The climate of the northern Behar has been said to form a medium between the dry parching heat of the Upper Provinces, and the close moist atmosphere of Bengal; in some respects this is correct. The seasons are in general very regular; the west wind prevails during the day, from the middle of April, and then tatties become necessary; the hot wind blows strong for about a month or six weeks, at this season; the dry heat of the day however is

modified in some degree by the easterly wind, which sets in with great regularity a little after sun set, and blows fresh all night—the wind at this season, from the regularity with which it blows from opposite directions, is called by the natives the *dorus;* the east wind contains a much greater degree of moisture than the west, but the extent I am unable to state, not having a hygrometer in my possession. Violent squalls, and storms from the north-west, whirlwinds and clouds of dust, accompanied sometimes with rain, or hailstones occasionally occur; at this time the thermometer ranges from 85° to 95° in the house, and placed in the direct rays of the sun for ten minutes, it ranges from 135° to 145°. From the middle of May until the commencement of the rains, light easterly winds prevail, the heat is oppressive during the day, and the nights are close and sultry.

Predominant winds.

Thermometer.

The rains commence about the middle of June, but there has been a peculiarity in the last two seasons. In 1836 the first heavy shower, we had, occurred on the 1st July, and this year we scarcely had a shower before the 7th of July; the regular rains terminated on the 7th of September in the former year, and this year the last shower, we had, was on the 8th September. In 1836 only 45 inches of rain fell during the twelve months, and this year, the fall of rain has been still more scanty, only 34 inches two-tenths have fallen; the quantity of rain of the present season, altogether, scarcely

Rains.

Winds. exceeds half of that of 1830, and 31. Easterly winds prevail, during the rainy season, and at this period the thermometer ranges from

Thermometer. 80° to 90° in the house.

Cold season. The cold weather begins about the middle of October—even before that period, the mornings and evenings are pleasantly cool; at this

Thermometer. season the thermometer ranges from 55° to 65°. The cold weather fogs are almost unknown, unless after a fall of rain, when we have them for a few mornings, but they rarely last beyond 9 or 10 o'clock. The coldest and clearest weather is, when the wind is from the

Winds. west or N. W.; the easterly winds at this season bring clouds and increase of temperature. From the middle of October, till the beginning of April, the weather is delightful in this part of Behar, dry, elastic and bracing; in January the grass about the station is covered with hoar-frost, and Europeans find fires in their chambers, and woollen clothes essential to their comfort; the natives enjoy neither luxury, and suffer dreadfully, during the night, from the cold.

General health amongst the Europeans in the district. Chuprah, regarded as a residence for Europeans, I consider remarkably healthy, very few cases of serious illness having occurred amongst the residents at the station, since I was appointed to it, in June 1826. In the district too, the general health among the European settlers is equally good, the planters expose themselves at all seasons, and although

they take a great deal of exercise in the sun, they retain their healthy European appearance, much longer here, than in any other part of India, that I have seen.

Chuprah might be rendered a more pleasant place of residence, particularly during the hot weather and rains, and much might be done to mitigate the harassing sensations of a high temperature; any improvement however could only be carried into effect by a rigid, though perhaps unpopular exercise of authority, on the part of Government; I could, with this end in view, condemn a vast number of trees, and root up all the bamboos now growing luxuriantly, within the precincts of the station. There can be nothing more unpleasant, or more prejudicial to health, than the stagnant atmosphere, we so frequently experience during the close, humid weather, in the rainy season, produced by the superabundance of mango groves, gardens and bamboos, in, and round the station. Trees are no doubt a great ornament, yet where they obstruct ventilation, they must be injurious, and bamboos engender swarms of vermin, reptiles, and insects, besides filth of every description, and serve as a nursery for frogs, and musquitoes.

Suggested improvements.

In the Sarun division of this district, which is in the highest state of cultivation, the general health of the native community, in ordinary years, is very good; epidemic small

General health amongst the natives.

pox, and cholera, almost every year, make their appearance in a greater or less degree; but I am not aware of any other general sickness, to which the inhabitants are subject.

Insalubrity. The Chumparun Division is very unhealthy, and from its proximity to the Tarai, it cannot be otherwise; the great quantity of waste lands, its numerous nullahs, and marshy jungles pregnant with miasma, must ever conduce to render Chumparun a hot bed of disease.

During this last season, the general health amongst the natives in both Sarun and Chumparun has been most deplorable, more especially in Chumparun, where villages have been almost depopulated. The cholera, small pox, and want of proper and nutritive food have fearfully increased the average rate of mortality; but it would be impossible, with the very imperfect knowledge, we possess of the statistics of the country, to state, with any degree of accuracy, what proportion the deaths of this year bear to those of past years: I should say, the mortality has perhaps been quadruple that of any ordinary season.

Tarai. At the conclusion of the Nepaul war, in 1815, the Government at one time, determined to insist, on the entire cession of the Tarai; the experience of a season's occupation of a considerable portion proved it of little value, and of extremely difficult management,

while the climate was so destructive, as to render the continuance of troops or civil officers, for one half of the year utterly impossible.

Climate of Chumparun.

Where Chumparun approaches the Nepaul Frontier, a large portion of the waste lands are covered with long grass, which is burned every year to improve the pasture; the grass is of a very bad quality, and the cattle, although plentifully supplied with it, are wretched to the last degree. Owing to the humidity of the atmosphere, and the geological difference in the soil, compared with Sarun, the fields preserve their verdure throughout the year; but the climates, which are the least favorable to the human constitution, are often the most so to vegetable productions, and this is markedly the case, in Chumparun; on the other hand, throughout the greater part of Sarun, in the dry season, the soil becomes exceedingly hard, and retains little moisture, so that in the hot weather, it is entirely destitute of vegetation.

Unhealthy seasons.

Drinking water.

The unhealthy season, in Chumparun, amongst the natives, commences in May, and at this time, in the northern parts, the drinking water becomes very impure, the numerous *Nullahs* swarm with animalculi, and the air, in their vicinity, becomes loaded with the poisonous gas exhaled, from vegetable and animal decomposition. The water in the *Denowtee,* (which is formed from a confluence

of a number of small hill streams) is said to be particularly obnoxious, when drank, producing fever, fluxes, goitre, and "all the ills that flesh is heir to." In the wells, the water contains a considerable quantity of saline matter; an English gallon was found to contain

Well water.

Sulphate of Soda, ... 26-4 grains
Muriate of Soda, ... 11-2 ditto
Nitrates and Carbonate of lime, 12-8 ditto

Total saline matter in solution, 50-2 per gallon.

The above sample was taken, in the month of April.

The chief exciting cause of the intermittent, and remitted fevers in Chumparun, there can be no doubt, is malaria, and that the moisture of the soil, the wastes, marshes, lakes, and jungles all concur in producing it. The nature of miasma is little known, it has by some been supposed to resemble heavy carbonated hydrogen gas, and to be incapable of rising high, in the atmosphere, and hence in low situations, intermittent and remittent fevers are found to be most prevalent. At the termination of the rainy season, it is supposed to be owing to the decomposition of animal and vegetable matter, and in the hot season, from that matter, being locked up during the cold weather, again being set free, and ripened into activity, by the heat of the sun; cold and moisture it has been said will not produce it; heat and

Malaria.

Properties of.

Sources of.

moisture in this country, we know to be its most common origin.

These effluvia are observed not to rise high, above the surface, and their effects to be avoided, by living in an elevated situation. It has been observed in the fenny counties in England, that those living in the attic stories escape, while those in the ground floor will be affected, and it is well known to every medical man, that *all* hours of the day or of the night are not attended with equal risk; the most dangerous time, it has been observed, is that which accompanies the setting, and that which precedes the rising sun; this circumstance seems to prove the union of miasmata with aqueous vapours rarified, in the middle of the day, by the heat; the elastic and lighter vapours must then occupy more space in the atmosphere, and the miasmata, which they carry with them, must also at such times be more widely diffused; we do not therefore inhale them, in so concentrated a degree, and consequently cannot in those hours be so much affected by them.

Union of miasma with aqueous exhalation.

When the army marched from Prome, on the 1st December 1825, the troops were exposed for several days, and nights, without tents, and obliged to *bivouac* on the ground; the consequence was, that a great number of the soldiers were attacked with remittent and intermittent fevers of the most malignant form, I ever witnessed. While in cantonments

the force had been pretty free from these diseases, but in the course of a week the field hospital was literally crowded, at the same time, it must be remarked, that many of the men were suffering from debility, induced by former disease, fatigue, and the want of proper nutritious food, which rendered them particularly susceptible of the effects of miasma.

Predisposing causes of fever.

Soldiers in health and strength, consequently not predisposed to disease, might have escaped.

Low diet, bedding, &c.

When we reflect on the poor diet in common use amongst the great mass of the natives in Chumparun, their wretched clothing, habit of reposing on the ground, in their damp abodes, with scarcely a mat under them, we can be at no loss to account for their predisposition to disease of every kind, more particularly to the influence of malaria. Among the indigo planters, who reside in Chumparun, the effects of malaria are seldom felt, although their places of residence are generally situated close to lakes or nullahs. This can only be accounted for, by their living in a style directly opposite to that of the natives, to the superior comfort of their dwellings, the generous diet made use of by Europeans, and their sleeping on beds elevated from the surface.

Indigo Planters exempt from malaria.

Experience does not appear to produce the same effect on the natives of India, that it does on the inhabitants of other nations, or it would

The Native behind other nations in protecting them-

have taught them, long before this, how to defend themselves from the damp at night, and from the coolness of the morning. selves from the effects of malaria.

The evening dew is so much dreaded at Rome, that as soon as it begins to be perceived, the people shut themselves up in their houses; but the moment this first and copious precipitation of vapour, which generally accompanies the close of a hot day, seems to be over, they all sally forth again, and the streets are more crowded than ever. The people of Italy never go abroad, unless absolutely obliged, till after sunrise, when the heat has dispersed the pernicious vapours, that have fallen during the night.

The inhabitants in the Sarun division of this district, at some seasons, come in for their share of remittent and intermittent fevers, more particularly those residing in the vicinity of rice fields; the rice in this part of the country is all transplanted, and when we have a plentiful fall of rain in September, and October, the crops are very abundant; this has not been the case, for the last two years. These miry and slimy marshes, acted on by a powerful sun, in October, and November, produce profuse aqueous exhalations, and for a time spread pestilence in their localities. In the month of January, and sometimes even before that period, these fields are all dry and hard, in consequence of the premature cessation of the rains. Rice fields.

Prevalent diseases.

Amongst the natives, in this part of Behar, the cholera, either in its epidemic or *sporadic* form, is an yearly occurrence; it generally breaks out, during the intense heat in May or June, and ceases when the rains have set in. On a sudden or premature cessation of the rains, in September, or early in October, it some years makes its appearance a second time, and the havoc produced by it, in some seasons, is dreadful.

Cholera.

From the time of Sauvages much has been written on this formidable and destructive disease, its remote and proximate causes; but I fear we are as much in the dark as ever, on those points, notwithstanding the zeal, talent and science which have been displayed on the subject. In this country, new rice, sable fish, drought, dampness, electricity, and stagnant waters have all in their turn got the credit of producing the cholera; reports too on the state of the weather have afforded no clue to an explanation of the causes, which lead to the production and progress of the disease. When the epidemic first appeared at Chuprah, about 20 years ago, in the month of September, the weather is said to have been excessively hot and dry; the disease then raged with such frightful violence, that within six days 360 deaths were reported by the chowkeedars; the alarm, excited by the ravages of the disease, prevailed to such a degree, that the town was nearly deserted by

its inhabitants, who sought an asylum in the neighbouring groves and fields.

" Old men with feeble feet and tottering babes,
" New widows with their infants in their arms,
" Hurried along. Nor royal festival,
" Nor sacred pageant, with like multitudes,
" E'er filled the public way, all whom (disease)
" Had spared were here; bed-rid infirmity
" Alone was left behind; the cripple plied
" His crutches; with the child of yesterday,
" The mother fled; and she whose hour was come,
" Fell by the road."

At the same period, excessive rain and dampness, in Bengal, it was said, produced precisely the same effects.

Small pox.

Epidemic small pox comes next on the list of destructive diseases amongst the native community, and with the exception of cholera, perhaps there is no disease, to which they are subject, tends so much to " lighten the burden of a poor man's family."

State of vaccination.

At every civil station, in this presidency, I believe a vaccine depôt is now established, and native vaccinators appointed, but the people in this part of the country have hitherto, most assuredly, shewn themselves little sensible to the humane intentions of Government; whether this arises from their known apathy, ignorance, or prejudice, I am unable to say; every means has been taken to obtain their confidence, by making known to them the great benefit arising from vaccination, and

proclamations have been issued, throughout the town and neighbourhood, explaining the protecting powers of the virus, the native vaccinator has been encouraged to exert himself, by holding out to him prospects of an increase to his salary, as an incentive to his industry and zeal, still I regret to say, my hopes of disseminating the vaccine virus extensively, in this part of the country, have been sadly disappointed. Few of the inhabitants bring their children, of their own accord, to be vaccinated, the native vaccinator is obliged to go, from place to place, to seek for children, and vaccinate them at their own houses; occasionally children in my immediate neighbourhood are brought to me.

Dysentery and Diarrhœa.

Dysentery and diarrhœa are also very fatal diseases amongst the lower orders, produced by their habit of sleeping on the ground, exposed to the heavy dews at night, and to atmospherical vicissitudes, particularly at the close of the rainy season, when the days are still hot, and the nights cold; no doubt the indiscriminate habit of bathing among old and young, male and female, whether suffering from visceral derangement or not, must frequently contribute to the fatal result.

Bathing.

Goitre.

The goitre is exceedingly common amongst the inhabitants of this district, more particularly in Chumparun, where it is endemial; it is frequently seen of an enormous size, and occasions great deformity; by some it is attri-

buted to the atmosphere, and by others to the drinking water.

It has been observed that the inhabitants of districts, in Europe, abounding with saline springs are more frequently affected with the goitre than persons living in other situations, and the well water in Chumparun is known to contain a considerable portion of saline matter; this circumstance would appear to support the opinion, that the disease is caused by the saline nature of the water, which the inhabitants in that part of the district are under the necessity of using.

Jail and hospital.

The jail is situated on the left of the public road leading to the westward, and a little to N. W. of the town of Chuprah; it is brick-built, and of an oblong form, surrounded by a wall, 12 feet high; within this is another wall of the same height, and within those again are the wards. The extreme length within the outer walls is 184 yards, and the extreme breadth 104 yards. The situation on which the buildings are erected is rather low, rather under the level of the surrounding ground.

General health amongst the prisoners.

In ordinary seasons, the prisoners are very healthy, but this last year is certainly an exception. I do not consider this in any way to result from the construction of the jail, nor would it seem to be contingent on particular seasons, but to depend on an original and permanent cause: namely, the lowness of the site.

Hospital. The Hospital is attached to the N. W. corner of the Jail, and consists of one ward, surrounded by a wall 12 feet high, enclosing a compound 54 yards long, and 44 yards broad; it has a verandah to the east and west, 4 yards in breadth; the floor of the ward is *pucka*, and measures about 30 yards by 9 yards.

The following table will shew the average number of prisoners, admissions into the Hospital, and mortality for 1836.

Return of the sick in the Jail Hospital at Sarun for 1836.

	Average number of Prisoners during the year.	Jany., Feby., March and April.				May, June, July and August.				Sept., Oct., Nov. and December.			
		Remaining 1st Jan.	Admitted.	Discharged.	Died.	Remaining 1st May.	Admitted.	Discharged.	Died.	Remaining 1st Sept.	Admitted.	Discharged.	Died.
Jail Hospital,	820	30	205	189	15	31	230	200	14	47	358	348	23

This year the average rate of mortality has been much greater.

TABLE I.

Shewing the Mortality amongst the different descriptions of Prisoners in the Sarun Jail for the year 1837.

Description of Prisoners.	Average No. in Jail.	Deaths from Ordinary Diseases.	Deaths from Cholera.	Ratio per Cent. of Deaths from Ordinary Diseases.	Ratio per Cent. of Deaths from Cholera.	General Ratio.
Hindoos, ...	669	81	28	12.10	4.18	14 79
Mussulmans, ...	71	17	4	23.94	5.73	15.49
Average Rates for 1837 from Ordinary Diseases, ...						13.24
Ditto ditto from Cholera, ...						4.32
General Average Rates per Cent.						17.56

TABLE II.

Classification of Deaths amongst the Prisoners in the Sarun Jail for 1837.

Civil Prisoners, ...	1
Prisoners exempt from labour, ...	9
Ditto ditto on Trial, ...	31
Prisoners sentenced to labour, ...	89
	130

TABLE III.

Shewing the Successive Periods of Imprisonment at which the deaths of 89 *Labouring Prisoners occurred, during* 1837, *in the Sarun Jail Hospital.*

During the first six months of Imprisonment, ...	43
During the remaining six months of the first year, ...	25
During the second year of Imprisonment, ...	10
Ditto third ditto ditto, ...	4
Ditto fourth ditto ditto, ...	3
Ditto fifth ditto ditto, ...	2
Ditto sixth ditto ditto, ...	1
Ditto twelfth ditto ditto, ...	1
Total	89

The prisoners in the Jail have participated largely, in the sickness, which has prevailed in an unusual, I may almost say unprecedented degree, throughout this district for the last eight months, and it can hardly be a matter of surprise, that the average mortality in the Hospital should exceed that of past years.

Site of the jail objectionable.

In Jails where men are crowded together, more particularly in low situations, there must be an accumulation of foul air to a certain extent, despite of drainage, and general cleanliness, and this animal effluvia, if not dissipated by free ventilation, becomes noxious and pestilential; the site of the Jail, I have above mentioned, is low and the walls surrounding it high, I am therefore disposed

to think, that the ventilation is not so perfect as it ought to be, indeed the wards can hardly be affected at all by the lower currents of air.

Sloughing ulcers.

A few months ago gangrenous ulcers prevailed to an alarming extent, and proved fatal in many cases; the smallest scratch on the leg became suddenly an extensive foul sore, and every remedy I could think of produced bitter disappointment for a time, nor did the disease abate, until the prisoners (at my request) were separated into different gangs, and sent out to work on the roads, and the patients in the Hospital removed, for change of air, into tents pitched at some distance from the Jail. The sores in every instance were on the legs, and produced by the bad construction, and coarse make of the fetters.

Bad construction of fetters.

The straight irons ought to be entirely abolished by an order of Government, and chains substituted. About two-thirds of the prisoners here wear straight irons, and I am quite certain the greater number of sores are produced by them; chains would afford equal security, the attainment of a greater amount of labour, and give much less bodily pain to the convict.

Prison discipline.

There are different wards for different descriptions of prisoners. The thug prisoners have a ward to themselves—those imprisoned without labour are separated from

the working prisoners, and those under trial are confined apart from the convicts.

Insufficiency of punishment.

The working prisoners are employed in repairing the roads, about the station, and its vicinity, and lately a few have been employed within the jail. In the present state of things they probably cannot be more usefully or beneficially employed, at the same time I think it very desirable, that some improvement should be made better calculated to promote the object of penal imprisonment, as well as to render the labour of convicts more productive, than the indiscriminate mode of employment hitherto observed.

Tread-mill.

The introduction of the tread-mill would probably be attended with good results, at all events it is worthy of a trial—the proceeds might go far towards defraying the expenses of the jail.

Classification of prisoners.

The classification of prisoners also demands the attention of Government.

This jail may be made capable of affording a classification, which is of paramount importance, as regards the morals and habits of the prisoners; at present, the distinction has reference merely to the court by which they have been sentenced, and not to the character and habits of the prisoners themselves,—we see the most vicious mingled with those, who probably have been imprisoned for a first

offence, and that perhaps comparatively a trifling one.

This pernicious contact must tend to render them as depraved, and hardened to every species of villainy, as their associates—again, no distinction is made between parties concerned in an affray, and those undergoing punishment for burglary and theft. In this district, parties concerned in affrays are frequently respectable land-holders, who have committed a breach of the law, in defending what they considered their rights; to throw this class of prisoners amongst the most vicious and abandoned not only adds to the severity of the punishment, but tends to injure or entirely destroy the little moral character, they may possess.

Diet and the dieting.

The system of dieting the prisoners was introduced into this jail about six months ago, and at first I was disposed to think favorably of the change, but further experience has not tended to confirm the favorable impression. To prevent abuses on the part of the bunniah, the strictest daily supervision is requisite, as to the quality of the rations; the quantity, is ample—the present allowance is rice 8 chuttacks, suttoo 4 chuttacks, dhall 2 chuttacks, wood ½ pice worth, and salt ½ pice weight. The wood allowed is not sufficient to enable each man to cook his rice separately, and the difference of caste is an impassable barrier to their cooking in messes. I am inclined to think the excess of bowel complaints, for some

months amongst the prisoners, is partly to be attributed to their eating food imperfectly cooked. The bunniah is obliged to contract on a large scale, and on several occasions has attempted to impose an inferior article on the prisoners; this, and the new plan has created great discontent amongst the prisoners—further I do not think the principal objection to the money ration system has been got rid of—namely, their paying the guard for little indulgences, for it is well known the practice is still continued. The only difference being, that in place of pice they pay in food.

The very idea of having the disposal of his own pice has a moral, as well as a physical effect on the health of a prisoner; with it he purchases to please his own taste, rice one day, ottah or suttoo the next, a small quantity of tobacco, which they all use, condiments, such as pepper of different kinds, *huldee* or any other little article, he may fancy. In the dieting system, he is obliged to eat the same food every day, or exchange it with a petty bunniah, for some other kind more suitable to his habit or health, sell it, which I am informed (with what degree of accuracy I am unable to say,) some of them do, and that for little more than one-half of the amount received by the jail bunniah, from Government, for feeding them.

With the former allowance of three bazar pice per day, they were content. The bunniah now receives from Government eleven

pie in Company's currency, which is four bazar pice or rather more, and there is nothing but dissatisfaction: the sooner the old plan is reverted to, the better, both on account of Government, and the health of the convicts.

Longevity.

From the circumstances of no records of births and death being kept in this country, it is impossible to form an accurate opinion on the subject of longevity amongst the native population; we occasionally see, some remarkable instances of very old looking men, bent double with years, but scarcely one of them can tell his age. I have known men, apparently 70 or 80 years of age, when asked how old they were, declare themselves not more than 25 or 30 years old, but generally when questioned regarding their age they state their utter ignorance on the subject. I have mentioned in another place in this paper, that we have no native practitioners of medicine of any repute, in the neighbourhood of Chuprah. In the conversations I have had with the *Hakeems*, they all professed the same doctrine, and staunchly supported the humoral pathology, and views of the *famous* philosopher Aristotle, that all diseases arise from heat or cold, and in accordance with this simple classification, prescribe their decoctions, infusions and lotions. In acute diseases their remedies are inert, and sometimes worse; for instance, when they think it necessary to open a vein, it is always done with the smallest possible orifice, so that the

Hakeems.

Low state of medicine.

blood may escape in drops, or in a stream about the size of a sewing thread, and when they think it necessary to have recourse to leeches, three or four are the most, they ever think of applying, more frequently, one or two: in their treatment of purulent ophthalmia, (a disease by no means uncommon among them at certain seasons,) their remedies consist entirely of decoctions of herbs. I have seen numerous instances of the loss of vision of one or both eyes, from their want of knowledge in the treatment of this disease.

Wretched state of surgery.

In surgery their notions are fully as crude and barbarous; for external bruises they seem to have only one remedy, rubbing the parts over with huldee, (turmeric) and cow dung; in external wounds their usual applications are opium, turmeric and lime, this forms a hard paste, which is allowed to remain, till the wound is cicatrized.

Among the numerous wounded men, who have been brought in, from the district, to be reported upon by me, I scarcely recollect a single case of death from excessive hemorrhage. I have seen three or four instances of men having a hand, or arms severed from the body, by one stroke of a sword, no ligature had been applied to the artery in these cases, or pressure of any kind, the effusion of blood was said to have been considerable at first, but was soon stopped by the application of a paste, composed of human

hair, opium, lime and pounded charcoal, this was laid over the surface of the stump, over which a piece of cloth was tied, and adhered with such tenacity, that it was detached with the greatest difficulty. The last case, I saw of this kind, was in the person of a stout, healthy Rajpoot, who had been engaged in an affray, and had got his left forearm completely severed by one blow from a sword; I did not see him, till the sixth day after he had been wounded; on removing the paste, I found the wound covered with healthy granulations, and the radius and ulna projecting a little, the projecting points of the bones mouldered away, and in less than a month the stump healed, in a conical shape.

Medicine.

The obstetric art is exclusively in the hands of the old women of the *chumar* caste; the chumines also prescribe for all female complaints, and get the credit of being very expert in procuring abortions; this crime I believe to be carried to a considerable extent, between 20 and 30 of these women are in practice in Chuprah.

Game and wild animals.

With the exception of quail in the dry season, and a few snipe, there is no game in the neighbourhood of Chuprah to invite the sportsman to the field, the country is so well cultivated, and free from jungle, that it affords game no protection in the breeding season. Far to the northward and westward, near the border of Goruckpore, there is abundance of

game of every kind; to the north in Chumparun, black partridges and hares are pretty plentiful, and in the Tarai, the industrious sportsman may be rewarded with a few tigers, bears, wild buffaloes, and deer; florikin, and every species of smaller game are also to be found there, in great numbers, but the pursuit is attended with considerable danger, after the month of March; in April, the unhealthy season commences in the Tarai. The jeels furnish wild ducks and teal abundantly, as also most other species of water fowl.

Poultry.

Poultry is rather dear at Chuprah, when compared with other stations, and it is some times difficult to be procured; this vicinity is almost entirely supplied with turkies and capons from Bettiah, a distance of 70 miles, they are reared there in considerable numbers, by the native Christians.

Supplies for the table.

The European residents at the station however can always get supplies for the table of every kind from Dinapore, which is only one night's dâk from Chuprah.

The most common trees to be found in this district are the mango, toddy, peepul, burr, or banyan tree, which sometimes grows to a great height, and is frequently to be met with covering two or three beeggahs of ground; the scissoo, mowah, toon, tamarind, and the jack fruit tree, &c.

Trees.

The most common timber used for building purposes is the saul, which is procured from the Goruckpoor jungle.

Several kinds of acacia are also to be found; —that, from which the *(kut,h)*, extract of catechu is procured, grows in immense forests on the western parts of the district; the extract forms an article of commerce, and is of the yellowish brown kind; the tree is called by the natives *kaira*; they obtain the extract by macerating the wood in holes or pits, previously having cut it into small pieces; after maceration is completed, the water is taken out, boiled and evaporated, the first of the operation exactly resembles the tanners' process with the oak bark in England.

Gum trees.

Garden trees.

Fruit trees of all kinds thrive in the gardens; the English apple, and vine are in profusion, the greengage plum, although not equal to the flavour of the fruit in its native soil, is far superior to the common country plums—the peach, pear, mango and all the indigenous fruit trees flourish, the soil being very favorable for gardens, and the trees are not subject to canker of any kind.

The medicinal plants, that I am acquainted with, indigenous to this part of the country, are not numerous.

Medicinal plants.

The poppy I have mentioned in another place; the madar is exceedingly common, in

every direction, and attains the height of four or five feet.

The castor oil plant is extensively cultivated, and the sonballi or croton plant may also occasionally be seen.

Currency.

There are four kinds of pice current in this district.

1st. The Chuprahah, peculiar to Chuprah, and its immediate neighbourhood.

2d. The Goruckpooree, coined in the Goruckpoor district.

3d. The Butowleah, deriving their name from Butool or Butowl in Oude, from whence they were originally transmitted.

4th. The new pice issued by the Company.

The Loteah pice or coin of Nepaul is also occasionally met with, but in such small quantities, that it has no fixed value, and cannot therefore well be taken into consideration.

The rates at which each are procurable in the bazar, are the following:

Description of Pice.	For Co.'s Rs.		For Sa. Rs.	
	To purchase from a banya.	To sell to a banya.	To purchase from a banya.	To sell to a banya.
Chuprah, ...	82	83	90	91
Gorruckpoor and Butowleah, ...	80	81	88	89
Company's,.....	63	64	69	70

The extent of circulation of each varies according to the number of pice obtainable in exchanges, the Chuprahah being most in demand; the Goruckpooree and Butowleah the next, about $\frac{1}{32}$ less than that of the Chuprahah, and the Company's the least. I have not been able to ascertain accurately the dates, since which the present coins have been in use, but all agree in stating that no others, with the exception of the Tirsoolies, have been current in this district, within the recollection of the present generation; as to the channel through which they have been brought into circulation—the Chuprahah are the produce of private mints in Chuprah, or its immediate neighbourhood, and the Goruckpooree and Butowleah, not being regular Government coins, there can be as little doubt have found their way into the district, by remittances, on account of private indi-

Extent of circulation of the different pice.

viduals, or in the general course of trade with those parts of the country, from which they were originally transmitted. But of the Company's pice I am assured, that private remittances are never known to have been made, and that the few now current, are those issued by the Government, through the medium of the Collector's office, and this supposition is, I think fully borne out, by the low rate of exchange, and the small extent of their circulation.

The same coins are in circulation throughout Sarun; they may probably be known by different names, in different places, and there may be some slight difference in their rates, as the distance from Chuprah is less or greater, but the coins are in fact the same, and bear about the same proportion to one another, in the extent of their circulation; the Company's new pice are probably still less frequently met with, than in the principal bazars.

Currency in Chumparun.

In Chumparun, none of these coins are current to any extent. The Lohea pice issued in large quantities by the Nepaulese, and spread over Chumparun, by means of their extensive traffic with that part of the district, have, for an indefinite period, been the only coin in use, on the other side of the Gunduck, and there I am assured the Company's pice are almost totally unknown.

Exchange.

In exchange the value of these pice is less, than many of the others, and has fluctuated

during the last four and half years, from 101 to 111 for the sicca, and 98 to 104 for the Company's rupees.

Daily labourers are always paid with the common bazar pice; in Sarun with the Chuprah or Goruckpooree, and in Chumparun with the Lohea; they receive six per day at Chuprah, and in the Mofussil four pice. Wages for labour paid in the common pice.

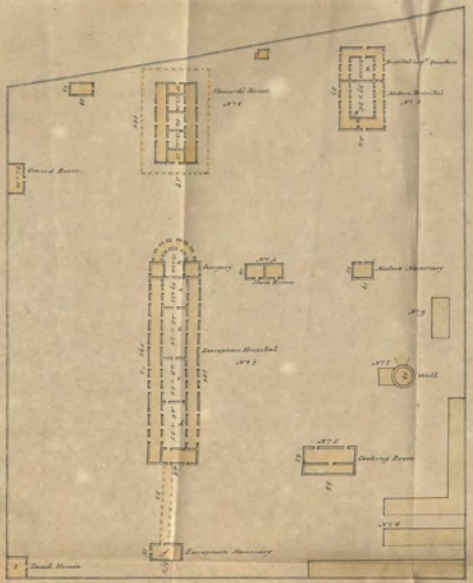
In exchange for whole rupees, the banyas always charge an arbitrary batta, varying from two to ten pice.

The only small silver coins in circulation, in the district, are the sicca, and Company's eight, and four anna pieces. In exchange for whole rupees, I have known the small coins at a premium. Batta.

Both the old and new gold mohurs are current, but the old has the greater circulation; the prices fluctuate from 16 rs. 8 as. to 18 rs. 8 as.—Except in the large towns, the gold mohurs are not in general circulation; they are principally monopolized by the bankers, and other wealthy people, and I believe a considerable destruction of this coin takes place, in making native ornaments. Gold mohurs.

FINIS.

G. H. Huttmann, Bengal Military Orphan Press.


Guard Room
Guard Room
Native Hospital
Surgery
Native Dispensary
European Hospital
Well
Cooking Room
European Necessary
Dead House
Artillery Hospital

Artillery Barracks
N. Troop Stables
Magazine
Guard Room
Riding school
Theatre
Racket Court
Stables
Officers Mess
Native Hospital
E. Hospital
H. A. Barracks
Cook Rooms
Staff Sgts
School Room
F. A. Barracks
Native Dhoby Lines
Officers Lines
Bazaar
Officers Racket Court

ON THE

TOPOGRAPHY OF MEERUTT,

AND

THE PRINCIPAL DISEASES WHICH PREVAILED IN THE 1ST BRIGADE OF HORSE ARTILLERY AT THAT PLACE.

By JOHN MURRAY, M. D.,

ASSISTANT SURGEON, 1ST BRIGADE HORSE ARTILLERY.

Printed by Order of Government.

CALCUTTA:

G. H. HUTTMANN, MILITARY ORPHAN PRESS.

1839.

Rx.C.69

9/5·45
murlon-t

ON THE

TOPOGRAPHY OF MEERUTT.

Its situation and population.

MEERUTT is one of the most ancient cities in India. It is situated in the centre of the Doab, nearly equi-distant from the Ganges and Jumna, and about 800 feet above the level of the sea. It is a large crowded city, containing about 30,000 inhabitants, surrounded by a pucka wall,* 15 feet in height. The cantonments are two miles north of the city. It is in Lat. 29° N. and Long. 77° 45′ S.

Appearance of the country.

The surrounding country is, like all the Doab, extremely level. The soil is light, alluvial, and very productive, in most places retaining its verdure during the hot season, and during the rains clothed with luxuriant vegetation, and in many places covered with water. The roads are sandy and heavy, but freely passable, except during this latter period. At all seasons boats pass on the Ganges, between Calcutta and Gurmucteesah, which is 30 miles from Meerutt.

* Built of burnt bricks and mortar.

Distance from the Ganges; right bank low & marshy —the Cauder abounds with tigers & game.

The river Ganges passes about 25 miles to the eastward. On the right bank, extending from Hurdwar to Gurmucteesah, (about 60 miles), varying in breadth, from half a mile to four miles, the land is low, marshy, and jungly, with high ground on the right. This tract is called the Cauder. It has been formed by various changes in the bed of the river. It abounds in tigers and game, and is a great source of attraction to the sporting gentlemen of the station, whose keenness often detains them till the hot season is far advanced, or even till the rains commence, and in consequence they frequently suffer from severe attacks of fever. Between the Cauder and Meerutt the soil is light, sandy, and alluvial, lying over a bed of kankur, from one to twenty feet in depth. It is perfectly level, with few trees and little jungle; there are a few trees in the gardens of the officers in the station, but they do not prevent the free circulation of air.

The soil.

Kallah Nuddee.

The Kallah Nuddee passes about three miles to the east; one small branch passing through the station. Its banks are low and marshy. In the cold, and hot seasons, it is a small stream, and during the rains it is lost in the general inundation.

Himalaya Mountains visible from the station.

The Himalaya Mountains are distinctly visible in clear mornings, particularly after rain. They are about 70 miles distant to the north-east. The Sanitarium of Landour is 120 miles distant. It is accessible at all seasons

of the year—the journey occupying 30 hours ; dak travellers, who are detained at the Keree Pass, (the entrance to the valley of the Dhoon), —towards the end of the rainy season, are liable to attacks of severe remittent fever ; though passing rapidly in the palkee does not often lead to any bad consequences ; civilians and officers generally send thir families to Mussooree, during the hot and rainy seasons, and then the children assume the florid ruddy appearance of the most healthy climates of Europe. The convalescent station of Simlah is about 200 miles distant—50 hours dak to Bar, at the foot of the hills, and three easy marches, in the hills, to Simlah. It is accessible at all seasons, without danger.

Their distance.

Meerutt is considered one of the most healthy stations in India. The average mortality during the last four years has been $2\frac{1}{3}$ per cent. amongst the Europeans, and $\frac{1}{3}$ per cent. amongst the natives. The climate passes through great changes in temperature and humidity ; but these are generally gradual and regular. The weather for five months, viz. from October to April is delightfully cool, and invigorating. The prevailing winds are westerly, and northerly, with little rain. In January the ground in the mornings is frequently covered with hoar-frost. Woollen clothing and fires are found necessary to comfort. In November, and March, the direct rays of the sun are very powerful and ought to be avoided—this is the most healthy season of the year ; the diseases are of an inflammatory

Its healthiness.

The climate.

nature, the fevers though intermitting yield to depletion, and antimonial purgatives, and do not generally require Quinine for their removal. Hepatic disease, with a strong tendency to abscess is common during this period.

Hot winds.

In April, the hot westerly wind commences; at first it begins in the afternoon, and ceases at sunset, afterwards in the morning, and continues during the greater part of the night. It crosses the arid sandy desert of Ajmere, which may account for its being a dry wind. It ceases in June. During this season there

North-westers frequent.

are occasionally typhoons—strong gales, from the north-west, coming on suddenly, carrying before them clouds of dust and leaves, accompanied by lightning and thunder, frequently terminating in rain, and leaving the air very cool and refreshing. During this season the lightest clothes are necessary for comfort. Most houses and the barracks and hospitals

Use of Tatties and Punkahs.

are kept cool by means of tatties, whilst the circulation of air is kept up in the rooms by punkahs during the day, and occasionally during the night also. These expedients do not agree with all people, even when well, and I have seen decided bad effects from them, in diseases induced by checked perspiration. By means of tatties and punkahs, and keeping in the house during the day, this season passes not unpleasantly, especially as, though hot and

Hot season not generally unhealthy.

relaxing, it is not generally unhealthy. Many, who have suffered severely from rheumatism, remittent fever, and spleen, enjoy better health, than during any other period of the

year. Fruit is abundant—as strawberries, loquats, peaches, apples, grapes, mangoes, &c. These eaten in an unripe state, combined with imprudently sleeping behind tatties, or in the open air, are frequent causes of dysenteric complaints; inflammation, intermittent fevers, and acute hepatic attacks are also common from exposure to the sun. Convalescence is less rapid than during the cold season.

Towards the end of June the winds become variable, and the weather close and cloudy, with occasional showers in the intervals, between which it is extremely oppressive, hot and damp. The regular rainy season then sets in, and it rains with little intermission, and continues pretty cool, till the beginning of September; during this month it is cloudy with little wind, and occasionally extremely hot, and exhausting—this is the most unhealthy season of the year. Dysenteric attacks are frequent, and typhoid intermittent or remittent fevers very common, particularly amongst the grass-cutters, whose occupation exposes them to unhealthy alluvial exhalations. In October, though the days are very hot, the nights gradually become cool and pleasant—the changes of temperature are considerable, and they are much felt, by those whose constitutions have been debilitated by the previous hot, and rainy seasons: dysentery, and remittent fever, of a more asthenic type, than at the other seasons, are common; convalescence is slow during this season.

Commencement of the rainy season.

The most unhealthy season of the year.

Average Range of Thermometer for 1833-4-5.

Range of the thermometer during the year.

Month.	Sun Rise.		Noon.		3. P. M.		No. of Rainy Days.
	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	
January,	54	32	73	54	73	55	1
February,	60	38	81	57	84	61	3
March,	67	47	85	62	88	62	4
April,	76	58	97	72	97	73	2
May,	89	71	97	88	100	88	1
June,	90	74	101	77	102	78	6
July,	82	75	89	78	90	78	19
August,	81	74	91	76	92	77	14
September,	84	69	87	76	88	75	10
October,	73	55	84	70	85	71	3
November,	63	45	75	65	76	66	2
December,	58	38	66	55	67	56	3

Climate favorable to diseases induced by a residence in the Lower Provinces.

The climate is found to be favorable to many of the diseases induced by residence in other, more damp, parts of India. Europeans do not often suffer from a first attack of remittent fever, though returns of this disease occur during the latter part of the rains. The general character of the diseases is asthenic, and except in hepatic cases, not leaving great organic derangement. Great advantage is derived in accelerating convalescence, and regaining strength by removal to the convalescent station at Landour. The violent exercise and high excitement in this branch of the service, viz. the Horse Artillery, in those who do not live more regularly, or carefully than other European soldiers, induce a tendency to acute inflammatory disease. This

combined with the severe falls and blows occasionally received, may account for the frequency of hepatic disease tending to the formation of abscess.

Frequency of hepatic disease amongst the Horse Artillery.

The Hospital (see plan No. 1,) is a low puckah, flat-roofed, building, surrounded by a compound wall 9 feet in height, situated 200 yards to the east of the barracks. It is surrounded by an enclosed verandah. It is hot, and wants an open verandah, in which the convalescents might walk, during the rains. It is freely ventilated, and the wards are kept as cool as possible, by tattees, during the hot weather: punkahs are used during the rains. There are four wards for Europeans, the first ([a]) is for the women and children—or for contagious diseases as small-pox. The second ([b]) is for the medical, and the third ([c]) for the surgical cases of the Horse Artillery, the fourth ([d]) is for the sick of the Company of Foot Artillery; they contain 12 or 14 beds each, allowing, when full, above a thousand cubic feet for each patient. The average strength of the European Artillery is 404, but I have never seen the wards full. The floors are puckah, the beds cane-bottomed, 6 feet by 3, standing $1\frac{1}{2}$ feet from the floor. No curtains are used, the matrasses are stuffed with hemp, the sheets and dresses are made of cotton, the resai or coverlet is formed by sewing a piece of coloured cotton over a blanket, the whole is kept clean, and in good order. The Surgery ([e]) occupies the north-east, and a covered walk leads from the south to ([f]) the necessary.

Description of the hospital and its appurtenances.

Native Hospital.

The Native Hospital (No. 2) is of a similar structure; with one ward (g) capable of containing 14 beds. This is much too small, the average strength is 1498; the verandahs are generally occupied by the sick, and more beds are put in the interior than there ought to be. The Hospital Sergeant lives in the other room (h).

Dead House.

The Dead House (No. 3) is at the south-west corner of the compound; the store-room (No. 4) and cook-room (No. 5) in the centre, with houses for the native servants (No. 6) in the south-east corner. There is an excellent puckah well (No. 7) near the cook-room; there is a good choppered thatched house, (No 8) containing three rooms and an enclosed verandah, over which an open verandah extends to the north of the Hospital for the Subordinate Medical Staff. A temporary building (No. 9) was erected in May, for the cases of yellow fever amongst the natives. The situation is low, and the compound is much under water, during the rainy season, and at this period cases of remittent fever occasionally appear amongst the native patients and servants, and also in the families of the Subordinate Medical Staff; but on the whole the situation is healthy. A Lock Hospital is urgently required, the women in the bazar are carefully examined once a week, but as the sick are treated as out-patients they may, and frequently do, disseminate their diseases.

Temporary building erected for cases of yellow fever among the natives — situation low.

Lock Hospital urgently wanted.

A NUMERICAL ABSTRACT OF THE HOSPITAL ESTABLISHMENT ATTACHED TO THE HOSPITAL OF THE MEERUTT DIVISION OF ARTILLERY.

EUROPEAN HOSPITAL ESTABLISHMENT.																				NATIVE HOSPITAL ESTABLISHMENT.					
Medical Department.								Steward's Department.																	
Surgeon.	Assistant Surgeon.	Apothecary.	Assistant Apothecary.	Apprentice.	Head Compounder.	Head Dresser.	Shop Coolees.	Steward.	Native Writer.	Steward's Servants.	Head Bheestee.	Bheestees.	Head Sweeper.	Sweepers.	Head Ward Coolee.	Ward Coolees.	Head Cook.	Cooks.	Tailors.	Barber.	Head Washerman.	Washerman.	Native Doctors.	Shop Coolee and Dresser.	Bheestee.	Sweeper.	Bramin Cook.	Goorgah.
1	1	1	1	1	1	2	3	1	1	2	1	4	1	5	1	10	1	3	2	1	1	3	4	1	1	1	1	1

Hospital Establishment.

Dhoolies.

When in cantonments, two dhoolies are attached to the Brigade, for conveying the sick or wounded, from the barracks or parade to the hospital. When marching, during peace, five doolees per cent. on the numerical strength, and during war ten per cent. are allowed for that purpose. Should more carriage be required during a march, covered hackeries (carts) are procured, on indent, on the nearest civil power.

Scale of the Barracks and description.

The barracks are similar low flat-roofed puckah buildings, though longer and wider than the hospital. Those for the Horse Artillery run in three parallel lines, (see plan) to the west of the hospital, while that for the company of Foot Artillery is to the east. The verandahs are closed in, one occupied by the married people, and subdivided by mats; the other contains the messes: they are hot, and deficient in not having an open verandah, for exercise. They are calculated to contain 76 beds in the interior, besides the verandahs and end rooms; they are 274 feet in length, 43 in breadth, and 13-4 in height; the verandahs are 8 feet broad.

The beds and floors are analogous to those in the hospital, the cook-rooms and necessaries are to the south of these respective barracks. The stables of the European troops are in six parallel lines to the north, those of the native troop to the north-east (see plan).

Wells.

There are three good puckah wells in the Horse Artillery, and two in the Foot Artillery,

and native lines; the well water of the station, like that of the Doab generally, is earthy, and brackish, except in a few old puckah wells, generally dug by the Mahrattas. The water is from 8 to 15 feet from the surface.

The situation of the barracks is very level, and much under water after heavy falls of rain; the drains are sufficient to carry off a moderate fall of rain, but not such as frequently falls, during the rainy season. Drains.

The parade is a level plain, a mile in breadth, and extending about four miles; to the westward in front of the Buff, Lancer, and native lines, it is bounded by the low sandy hills; it is low and marshy towards the east, terminating in a large pool, called the Dhobee's Tank. The Parade.

The Congee House is a low puckah building, situated to the north of the hospital; there are 16 cells, each 10 feet by 8. The food of the prisoners is one pound of bread per diem, with a jar of water, and a single quilt for furniture. When sick, they are removed to the hospital, and placed amongst the other patients; delirium tremens is often developed, after confinement, and rheumatism in the subacute form, called "the pains," sometimes afflicts the inmates. The Congee House.

The chief amusements of the men are long bowles, and fives; they have a very good The Soldiers' amusements.

library, and theatre, both great sources of agreeable occupation.

The following is a List of a Horse Artillery-man's Regimental Necessaries.

Regimental necessaries of a Horse Artillery man.

Blue Jacket,	1	
Leather Breeches,	1	
Warm Overalls,	1	
Cloak,	1	
Sash,	1	
Helmet,	1	
Long Boots,	1	pair
Spurs,	1	„
Straps for Overalls,	1	„
Leather Gloves,	1	„
Jackets, white,	6	
Pantaloons, ditto,	6	
Shirts,	6	
Stockings,	6	pairs
Flannel Drawers,	2	„
Flannel Banyans,	2	
Short Boots,	2	pairs
Stable Undress Cap,	1	
Stock,	1	

The white, warm weather clothing is worn from the 1st April to the 1st November; very few wear flannel belts, during the hot weather, though they would prove of the greatest advantage in preventing sudden changes of temperature, on the surface of the body. I have never traced any bad effects from wearing flannel next the skin, and it is always

recommended to those, who have suffered from severe abdominal disease. The spirits consumed in the Canteen are rum, and brandy, with wine and beer. Rum is the principal article in demand, the quality is good, and the price eight annas a bottle. The men are allowed to drink, in the Canteen, as much as they can pay for, so long as they are not drunk. This is allowing too much discretionary power, under unfavorable circumstances, to men not generally remarkable for abstinence, as a man may ruin his health by repeated or continued high excitement, though it do not proceed to intoxication. Within these last few years, beer brewed at this station by an enterprising individual, Mr. Bholee, has been much used. The draught beer costs two annas, and the bottled eight annas per quart. The former is most generally used; but it is apt to get sour in the hot weather, before the cask is exhausted. It is in general used by the steady men, and there are very few cases of delirium tremens amongst its consumers.

Canteen, and what liquors drank.

Beer brewed at the station, its price.

Bazar spirits are not much used, they are commonly so acrid, that only desperately vitiated palates, and men wavering between excitement and horror, (the precursors of delirium tremens), could swallow them. I believe it impossible to prevent their being smuggled occasionally into barracks, or even into the hospital, though it has the advantage of a high wall, with a sentinel at the gate, and a guard in the interior. It is concealed in

Country spirits not much consumed.

Irregular supplies of food to the sick.

parcels, bladders, intestines, twisted round the body, and even in their boots. Improper food is sometimes conveyed to the patients, it is generally very easily detected, by the quantity, and nature of the evacuations, combined with some unfavorable change in the symptoms of the case. I punish the consumer, at the same time explaining the injustice to the medical treatment, the loss to the service, and the chance of ruining their constitutions, and losing the service without a pension, independent of the immediate prospect of a court martial. When once detected, they seldom repeat the offence.

An Abstract of the Hospital Reports of the Meerutt Division of Artillery, from the 1st January 1833, to the 1st June 1837.

Abstract of Medical Reports from 1833 to 1837.

Average Strength. Europeans, ... 404. Natives, ... 1498.	Europeans.		Natives.	
	Admd.	Died.	Admd.	Died.
Apoplexy,	9	5	1	0
Asthma,	0	0	3	1
Cutaneous Diseases,	2	0	0	0
Cholera,	15	3	4	1
Diarrhæa,	31	0	16	1
Dropsical Affections,	1	0	3	0
Dysentery,	102	3	12	1
Dislocations and Sprains,	12	0	4	0
Delirium Tremens,	68	4	0	0
Fractures,	19	0	15	0
Fevers, ... Remittent,	44	2	20	4
Fevers, ... Intermittent,	190	5	229	11
Gonorrhæa,	67	0	2	0
Hepatic Affections, Acute, ...	56	5	2	1
Hepatic Affections, Chronic,...	9	2	0	0
Inflammations,.. External,	24	0	0	0
Inflammations,.. Cephalic,	1	0	0	0
Inflammations,.. Thoracic,	2	0	0	0
Inflammations,.. Abdominal, ...	1	0	0	0
Affections of Urinary Organs,	6	0	2	0
Mania,	1	0	0	0
Ophthalmic Affections, Acute,...	36	0	18	0
Ophthalmic Affections, Chronic,	1	0	1	0
Phthisis Pulmonalis,	19	5	3	1
Rheumatism,	51	1	34	3
Spleen,	3	0	0	0
Syphilis, ... Primary,	113	0	23	0
Syphilis, ... Secondary,	2	0	0	0
Small Pox,	15	1	9	0
Ulcers,	78	0	90	0
Wounds and Accidents,	281	3	298	1
Other Diseases,	298	4	62	1
	1557	43	851	26.
Average Mortality to Sick,	2.76		3.05	
Do. to Strength per Annum,	2.42		0.40	

Mode of treating the principal diseases.

The following observations are intended to show the peculiarities in the treatment of the diseases, in this part of India. In hot damp stations, a similar mode of treatment would

not be equally successful. I joined this Division in November 1833, and since then, have several times been detached with Europeans marching in this part of the country, and absent in the hills on sick certificate. In consequence of the sickness of the Surgeon of the Brigade, the sick have been generally under my charge since October, previous to that period, I attended half the European, with the Native sick. The treatment recorded is what has generally been found most successful at this station. I have added the result of the cases, that came under my charge when detached, when the result tends to confirm any mode of treatment not generally employed.

Apoplexy. *Apoplexy.*—This disease differs in no respect in its symptoms, or pathology, from the apoplexy of Europe. The cause is generally exposure to the direct rays of the sun—the sanguineous is most common.

The treatment is copious depletion, with strong mercurial, or croton purgatives, followed by local depletion, and counter-irritation, applying nux vomica to the blistered surface, and inducing mercurial action.

There have been nine cases amongst the Europeans, five of which have proved fatal, and one successful case in a native.

Cholera. *Cholera.*—This disease shows all the characteristic symptoms, with all the varieties found in other parts of India. The attacks of

the Europeans are analogous to those, I saw in Paris in 1832, when it carried off upwards of a thousand a day.

I have not observed any change of structure in the vital organs, invariably present, and those most frequently found might have been influenced by the remedies. The blood is unnatural, but whether this arises, from the addition, or retention of noctious ingredients, or from a combination of both, or from loss of some essential part—or the cause of this change—I know not.

Treatment of Cholera.

I have seen most modes of treatment, that have been suggested, tried unsuccessfully—and many experiments made, that never were published. Before the supervention of the collapsed stage, v. s., with large doses of calomel and opium, followed up by castor oil, blister to the epigastrium, with hot frictions of the extremities, is most successful, but occasionally totally ineffective. The disease occasionally yields, after the collapsed stage has commenced, whilst these remedies, or stimulants, or hot vapour baths are employed, but the only remedy, that I have invariably seen exert an influence on the disease has been a saline solution. In 1833 I first employed this remedy, in collapsed blue cases, by transfusing, through the veins in the arm, from three to five pints of a solution, containing one drachm of salt, and one scruple of carbonate of soda, to the pint of warm water, heat 110° F. In all reaction was induced, when various

opposite modes of treatment were employed; in all purging returned with collapse, and death followed. It was given by the mouth, but it induced vomiting, and produced no benefit. This disease again came under my notice in 1834, when with a detachment of His Majesty's 11th Dragoons. The symptoms, and the treatment, and its effects were analogous to what I have mentioned. From considerng the decided, though temporary action of the saline solution, when transfused through the veins, together with its inefficacy when swallowed, I resolved to try it, in the form of enema, administered hot, and at short intervals. The following extract is from a report to Dr. Burk, Inspector General of Hospitals, in November 1834.

Saline Enemata.

"In Marshall's case (of Cholera), the usual treatment, viz. calomel and opium, was pursued but without success; at 6 p. m. six hours after admission, the pulse was not perceptible at the wrist, the skin cold, blue and clammy, the countenance collapsed, and the voice gone; I thought the case hopeless, but as I had in several cases, on a former occasion, found decided, though temporary, benefit in this stage of the disease from the transfusion of a *saline fluid* into the veins, I ordered the following to be administered, as an enema, every half hour.

℞ : Muriatis Sodœ ʒss.
Carbonatis Sodœ ʒj.
Aqua Calidœ (120° F.) ℔j.

At 3 p. m. he was asleep; the pulse perceptible at the wrist. He had received two enemata. He got three more during night, at intervals, when he awoke. He had slept pretty well. The pulse was distinct, and the skin warm. The countenance more natural, and the voice partially restored. The enemata were repeated every hour till noon, when the countenance and voice were natural, the pulse distinct, and skin warm; some brown matter brought away with the enemata; mercurial purgatives were then employed, and bilious stools procured, and he gradually regained strength, under the use of bitter laxatives. The effect of the saline fluid, administered in this manner, is not so rapid, as when passed directly into the circulation. In these, the change to the florid appearance of health, and return of the pulse, with the cessation of the spasm, was simultaneous with the transfusion. The temperature of the water I consider of importance. The order, (in absence of a thermometer,) was, "to be given "as hot as could be borne, by the hand, without "inconvenience."

Since that period I have tried this remedy in several cases, both European and native, varying the strength of the solution, and the frequency of its repetition, according to the violence of the symptoms, and the effect of the remedy. I have only lost one patient since, from this disease, a native, in whom the pulse had disappeared from the

wrist. After two enemata, the pulse returned, and the vomiting and cramps ceased. I could not get a satisfactory account after this period. I believe the enemata, were omitted, and he sunk.

The following case shows the advanced stage of the disease, from which this remedy has produced a cure. The reaction under the use of the saline solution—the collapse returning on its being omitted, and reaction following its being resumed, clearly connect them, as cause and effect. It occurred on a march, from Cawnpore, with the 3rd Troop 1st Brigade Horse Artillery in 1835. April 16th, Lalloo syce, æt. 50, was seized with cholera at 10 a. m. I saw him at ½ p. 11, he complained of violent vomiting and purging of a congee fluid, with severe cramps of the extremities and abdomen. Pulse very quick and weak, countenance shrunk.

℞ : Pulv. Opii. gr. ii.
Subm. Hydr. gr. x. m. ft. pulvis. stat : sumend, et meridie repetend—

1 p. m.—Has had several watery stools ; is collapsed, no pulse at wrist, or temples ; eyes glazed and fixed ; cannot speak, extremities cold.

℞ : Mur : Sodœ ℥j.
Carb : Sodœ ʒj.
Aq : Calidœ (120° F.) ℔j. solve, fiat enema, omni semihora injiciendum.

3 p. m.—Slight pulse at temples, a little warmth about the neck, speaks in a whisper, no vomiting nor cramps.

Cont: Enemata omni hora.

6 p. m.—Pulse perceptible, very quick at the wrist; arms and head warm; perspiring; countenance more natural.

Cont. Enemata 2d[a] quaque hora.

9 p. m.—Pulse full and quick; skin warm; feels very comfortable; voice more natural.

Cont. Enemata.

17th, 6 a. m.—The enemata were omitted, during the night, on the march. The extremities are now cold. Pulse very weak and quick, no return of vomiting, or cramps; voice broken.

Rept. Enemata omni hora.

9 a. m.—Pulse quick and full; voice more natural; skin warm on the trunk and head.

Subm. Hydr. gr. v. st. sumend.
Ol: Ricini. ℥j. meridie.

6 p. m.—Several dark fæculent stools; has slight headach. Pulse quick and hard; skin hot.

Rept. Subm. Hydr.

He was slightly feverish for several days; bitter laxatives completed the cure.

Dysentery.

Dysentery.—The symptoms of this disease are similar to those usually described, by writers on Tropical diseases, and to those which I described, in the Transactions of the Medical and Physical Society, vol. vi. p. 101. I am gratified in finding the opinion, I have advanced of this disease, being occasionally of an eruptive nature, supported by that of Mr. Twining, in the 2nd edition of his work on the diseases of Bengal, published, nearly a year, after that paper was discussed in the Society, of which he was Secretary; the probable connection between ulceration of the colon and hepatic abscess, 2d edition vol. i. p. 232, Note, will also be found in that paper, though he has forgot to mention these two circumstances. But, "de mortuis nil nisi bonum."

Causes of the disease.

The disease is most common, during the hot and rainy seasons. The general causes are, sleeping in a current of air, or behind a tattee—eating unripe fruit, or drinking cold water, when much heated, and exhausted—I have seen no cases here, that I could trace to contagion, though many of the cases, that occurred in the detachment of recruits proceeding from Calcutta to Cawnpore in 1833, evidently arose from that cause.

Treatment.

In the treatment of this disease, the chief reliance is placed on v. s. The patient is bled, from a large orifice, in the erect posture, to syncope, and this is repeated twelve hours afterwards, should there be no improvement

in the nature of the evacuations, and again under similar circumstances, after another interval of twelve hours. I have never required to order a fourth bleeding. Twelve hours after decided improvement has taken place, leeches are applied over the part of the colon most affected, and repeated at similar intervals, as long as any active inflammation is present—as indicated by the nature of the stools—tormina or tenesmus. The internal treatment consists of an ounce of castor oil, containing from five to twenty-five drops of laudanum, given on admission, with two of the following pills, every two or three hours, according to the urgency of the symptoms : Treatment continued.

℞ Pulv. Ipecacuanhœ
Ext. colocynthidis Comp :
Ext. gentianœ ā ā ℈ i. m.
Ft. massa, in pil. xii dividenda.

The interval is increased, and the dose diminished, as the disease yields, and the stomach becomes irritable. In cases complicated with affections of the liver, one grain of calomel or blue pill is added to each pill, after the more acute symptoms subside. Bitter laxatives complete the cure. It is essentially necessary to the success of this mode of treatment—that no solid food, and only a very little liquid be taken, when active inflammation is present. During the first, and second days, merely a little tea is allowed—afterwards an ounce of sago, made with water, is given three Diet in Dysentery.

times a day—the diet is gradually increased, as convalescence advances.

Sequelœ of Dysentery & their treatment.

The above mode of treatment is generally sufficient for all cases, that have not been three days ill before admission. After this period, the effects of the inflammation have to be treated, after the inflammation is subdued by the above mentioned means, these are thickening, or more generally ulceration of the coats of the colon. In many cases, persisting in these means, for a longer period is sufficient, but when the ulcers become indolent, as indicated by frequent whitish mucous stools, with little tormina or tenesmus, and dull pain on pressure, with fulness over part of the colon—a blister is applied, and half a grain of sulphate of copper substituted for the Ipecacuan, —and the following powder given, every second night:

℞ Tart. Antimon. gr. j.
Subm. Hydr gr. v. m.

when the tenesmus is distressing, an enema of

Lot: Acetat: Plumbi ʒ ii.
Tinct: Opii ʒ ii.

given at bed time, gives relief. In one or two protracted cases, the following powder, every three hours, has been useful:

℞ Pulv: Opii. gr. ½
Acetat: Plumbi gr. ii.

I have not seen any advantage, from giving free purgatives every morning, as

recommended by many authors. The castor oil with laudanum, after the bleeding, freely evacuates the bowels, no food is allowed, that could leave any existing fœculent matter, and the small quantity of colocynth in each pill removes the secretions. When the cœcum and iliocolic valve are affected, vomiting is very troublesome, in such cases, advantage is derived from the application of a blister, before the active depletion has ceased. When hepatic obstruction exists—mercurial action is excited;—I have only employed this last remedy in two cases.

Diarrhœa, when not colliquative or dependent on chronic enlargement of the liver or spleen, yields readily to analogous—though milder treatment.

Result of treatment.

There have been, amongst the Europeans, 31 cases of diarrhœa, and 102 of dysentery, of which three have proved fatal. I have had about fifty other cases unconnected with this Brigade, only one of which died—this termination was produced by cholera, the day after admission. Amongst the natives, there have been sixteen cases of diarrhœa, and twelve cases of dysentery, one of each of which proved fatal.

Delirium Tremens.

Delirium Tremens is a common disease, and though not attributable to any peculiarity in this branch, is still partly dependent on Military service. It appears after an excessive debauch, or suddenly ceasing the

Delirium Tremens.

habitual use of too much spirits—most Military offences are committed, when *under the influence of liquor*, the most frequent punishment is confinement to the guard or conjee house, where the food is bread and water, and where spirits are strictly prohibited; such are the circumstances under which this disease is to be anticipated, and such is the history of most of the cases. It is usually guarded off, in the barracks, by gradually discontinuing the stimulants, and such is indicated, as the prophylactic treatment—but as giving the usual stimulant would diminish the punishment, it ought to be combined with some bitter, as gentian or cheretta, and as constipation is a frequent concomitant, the addition of senna would be advantageous. I never saw a native labouring under delirium tremens.

Its treatment.

In the treatment of this disease, I have found depletion, and counter-irritation assist the action of the opiates, in a very marked degree—bleeding to fainting in the young and plethoric, or leeches to the nape of the neck in old broken-down subjects, with strong mercurial purgatives are employed on admission, with two drachms of laudanum or four grains of opium, every three hours, during the night. Next day, should sleep not have been induced, a scruple of calomel and one grain of tartar emetic is given in the morning, and two drachms of compound powder of jalap at noon, or an antimonial purgative, in small doses, during the day, repeating the opiate at night.

Should this not have induced sleep, the calomel is repeated next morning, with the jalap at noon, and a blister is applied to the nape of the neck, and the opiate repeated at night. There are few cases, in which sleep is not induced before next morning; then a few stimulant purgatives complete the cure. Should the third night pass restless and furious without sleep, four grains of calomel and one of opium are given, every three hours, during the day, and at night a caustic blister to the neck, with the strong opiates repeated. I have seen the patient sink into a sound sleep ten minutes after the application of this blister, before any additional opiate had been given. This mode of treatment is continued till sleep be induced, which takes place generally on the first, and very rarely later than the second day. The mouth is always found affected by the mercury, when the patients waken. Stimulant laxatives finish the cure—the mouth sometimes becomes very sore.

Treatment continued.

The worst cases appear in broken-down confirmed old drunkards, who have not been many weeks discharged, till they return with aggravated symptoms. In these cases the stomach is very irritable, the pulse quick, weak and irregular, and the secretions very much deranged. In these cases a blister is applied to the epigastrum, the bowels freely opened by purgative enemata, and occasionally the opiates are given in enemata. The insensibility of the system to the action of opiates is

In confirmed drunkards.

Treatment continued.

remarkable. One patient retained an ounce and a half of laudanum, (given in four enemata of three drachm doses, at intervals of three hours,) for some time, without producing any sensible effect—he afterwards recovered.

The irritability of stomach in many cases depends on the state of the brain; in some, from the tenderness or pain on pressure over the epigastrum, it is evidently connected with gastritis. In these, depletion, with purgative enemata, and effervescing draughts containing laudanum, and a blister to the epigastrium remove the irritability, and generally induce sleep. Cases, complicated with hypertrophy of the heart, are most violent, and complications with disease of the lungs most dangerous.

Result of treatment.

There have been sixty-eight cases admitted, of which four have proved fatal. Three of these confirmed old drunkards, one of whom had extensive cavernous ulceration in the lungs; another had the cortical part of both kidneys nearly all destroyed, combined with great enlargement of the liver; the other had the liver very much enlarged, with the cicatrices of several old abscesses. The fourth patient drowned himself, the day after admission. The case is subjoined, as very important, in showing the morbid appearances, in the first stage of this disease.

Case of Delirium Tremens.

Pat. O'Connor, æt. 29, Gunner, 1 Company 3d Battalion—convalescent from intermittent fever; on his way from Mhow to Landour, has

several times suffered from delirium tremens, during which he is reported to have been exceedingly violent; has been drinking hard for several days. He attempted to cut his throat at 3 p. m. and was brought to Hospital at 5 p. m. on the 2d March 1836—he is restless, has not slept for four nights—no pain, bowels costive, p. 76, T. clean, S. cool.

℞ Pulv: Ipecac. ℈i.

Tart: Antimon: gr. ii. ft. pulvis st: sumendus.

℞ Subm: Hydr: gr. x.

Ext: Colocynth: Comp: ℈i. ft. massa in pil. iv. divid: hora somni sumendas.

Pulv: Jalap: Comp: ʒ ii. cras mane.

3d, Bowels freely opened, was restless, did not sleep, is quiet, and says he is quite well; p. 76, T. clean, S. cool.

℞ Tinct: Sennæ ʒ i.

Infus: Cherettæ ʒii. m. ft. haustus statim sumendus, et meridie repetendus—spoon diet.

Vespere. Continued well, and cheerful during the day;—at half-past five, slipt from his guard, jumped into the Hospital well, sunk immediately, and was dragged up, half an hour afterwards—dead.

Sectio Cadaveris, 14 hours after death. Body not emaciated—frothy fluid issuing from the mouth, and nostrils—the pendent parts of the body livid, the upper pale; limbs rigid; blood dark, liquid. Autopsy.

Autopsy continued.

Head—Venous congestion on the surface, and more bloody points, than natural, in the substance of the brain, which was of the usual firmness. Two ounces and a half of serous fluid, under the arachnoid, and in the lateral ventricles.

Thorax.—Lungs emphysematous ; did not collapse when the thorax was opened, frothy fluid in the bronchia, and through the lungs, which were heavier than natural—heart empty, with considerable hypertrophy of the left ventricle.

Abdomen.—Liver and spleen considerably enlarged, structure natural—there was a florid flush over the intestines; and they felt doughy; —stomach much distended with food and water—mucous coat very vascular, and much thickened. Gall bladder small, covered by a false membrane, and adhering to the colon, it contained a small quantity of light yellow bile.

Remarks.—The previous attacks had commenced in a similar manner. From the mildness of the symptoms, I tried to ward off the attack—opiates would have been given at night.

Fevers.

Fevers.—Continued fever is very rare—the few cases, that occur, appear in the hot season, and arise from exposure to the sun. The symptoms are headach, pain in the loins,

and limbs, with hot dry skin, and quick hard pulse.

The treatment is purely antiphlogistic, viz. v. s. leeches, antimonials, and purgatives.

Types of Fever.

There is no distinct line of demarcation between the intermittent and remittent fevers, the former occasionally assuming the latter type, and vice versa; and either, in their progress becoming continued. The most common form, during the cold and hot seasons, is an inflammatory quotidian, commencing with rigors, and followed by sweating. The rigors, as the disease advances, become less distinct, the sweating more partial, and the remission less perfect, whilst the hot stage becomes longer, and at last constant. It commences occasionally as a tertian, and passes through a similar course, becoming constant after the third or fourth paroxysm, delirium or symptoms of some organic lesion are then developed, if not previously evident. Headach, pain in the loins, and thirst are the symptoms most commonly complained of. The bowels are costive, with occasional nausea. Tongue furred, pulse quick, and hard. Skin dry, conveying a harsh, tingling, sensation to the touch. This dryness occasionally remains, after the other symptoms have disappeared, but while this is present, convalescence is not established.

Treatment.

The treatment is generally purely antiphlogistic. On admission the patient is bled

Treatment continued.

to fainting, and gets a purgative of calomel and jalap, with the following draught every three hours.

℞ Tart. Antimon : gr. j.
Infus : Sennœ. ℥ ij. m.

At night, if much local pain or hardness of pulse remain, v. s. is repeated, and the following powder given :

R. Tart : Antimon : gr. j.
Subm : Hydr : gr. x. m.

but should there be much improvement, leeches are applied, instead of the v. s. and the antimonial mixture continued.

On the following morning, according to the progress of the symptoms v. s. or leeches are employed, and the antimonial mixture continued during the day, and leeches and the calomel powder at night, should the symptoms not be very much diminished; but in the great majority of cases, continuing the antimonial mixture is sufficient to remove all the symptoms. It is afterwards given at longer intervals, and the cure is completed by bitter laxatives.

Diet.

The diet is confined to sago, as long as dryness of the skin remains, then milk and bread allowed, and the diet gradually increased.

Occasionally the headach continues with quick pulse, dry skin, and restlessness or

delirium after the third night, then the local depletion is continued, with five grains of calomel every three hours, using a purgative, if the bowels be not freely opened, and at night repeating the leeches or applying a blister, and giving the accompanying powder; Treatment continued.

℞ Tart. Antimon. gr. ii.
Subm. Hydr. ℈j. m.

omitting the antimony, should the stomach be very irritable, the calomel is continued next day, till mercurial action be induced, when the symptoms generally yield, and laxatives finish the cure. Sulphate of quinine is found beneficial in accelerating convalescence; though it is generally pernicious, if given early, when dryness of the skin remains. When the fever assumes a distinct tertian type, the sulphate of quinine is an invaluable remedy, and rarely fails in producing a cure, after the bowels are freely opened, and the secretions become natural. It is found most efficacious, when given uncombined with other medicine, in divided doses, the intervals so calculated, that one dose shall be given, half an hour before the usual period of attack. Of Quinine in Fever.

In a few instances, generally towards the end of the rains, the disease assumes a typhoid remittent type, the chief characteristics of which are rapid prostration of strength, quick, weak pulse; partial, clammy sweats, and low muttering delirium. This rarely appears in the cold or hot seasons, when the abovementioned Of a typhoid type.

Treatment of Fever continued.

treatment is *early* had recourse to. When the disease assumes this form, calomel and tartarate of antimony are given during the exacerbation, and sulphate of quinine, when a distinct remission is procured—counter-irritation is employed, and the bowels kept freely open. In cases, where immediate danger was anticipated, calomel combined with quinine was given, during the partial remission, if the head were cool—even though there were headach, and delirium, during the exacerbation. It appears, in these cases, to render the system susceptible of mercurial influence, —and when plyatism is excited, recovery ensues. I have given the quinine successfully under these circumstances, when from the dull headach, dilated pupil, and giddiness on assuming the erect posture, I inferred that effusion had taken place on the brain. It is a powerful, active remedy, even when scruple doses of calomel appear inert—and its effects must be closely watched. I persist in its use, even though it increase the headach—if the pulse become slower, and the head remain cool. When the pulse becomes strong, and the head hot, the quinine is omitted, and the calomel continued with purgatives, according to the state of the bowels ; it is resumed, on the remission re-appearing—and Ptyalism may then be anticipated. When there was great prostration of strength, with coldness of the extremities, a favorable result has been assisted by a combination of quinine, port wine and cheretta—quinine is of great use

in the convalescence of these cases—and a change of air is generally necessary to re-establish health. In cases of this description, the closest attention is necessary to the developement of old, or the supervention of new symptoms—these may require local depletion —whilst general stimulant treatment is pursued—the local complications will generally indicate the treatment, during convalescence.

Effects of Mercury in Spleen.

The use of very large quantities of mercury occasionally produces no constitutional effect, till some days, or even weeks, after it has been discontinued, and convalescence has been established, then the gums become swollen, and shrink from the darkened teeth. Excessive salivation, with ulceration of the gums, tongue and cheeks, occasionally supervenes towards the end of the rainy season. This accident is generally connected with enlargement of the spleen; but I have seen severe salivation, when it was not apparently enlarged, from a few grains of calomel—in one case, nineteen grains, and in another sixteen grains of blue pill. Sulphur in repeated full doses was given in these cases, and in none did sloughing of the cheek nor necrosis of the jaw ensue; though I had two patients during the season, under my charge, to whom these accidents happened.

Result of treatment.

There have been two hundred and thirty-four European cases of fever, of which seven have proved fatal; and two hundred and forty-nine native admissions, of which fifteen have died.

Remittent fever among the natives of a virulent and contagious type.

Since the commencement of the last cold season, the natives have suffered from a very dangerous remittent fever, with yellowness of the skin, and conjunctiva; they seldom complained of local pains. The most prominent symptoms, at the commencement, were suffused eyes, slight headach, and great prostration of strength, with early delirium during the hot stage; the remissions at first well marked, became indistinct after the second day, and yellowness of the conjunctiva, great prostration of strength, sordes on the teeth, quick feeble pulse, low muttering delirium, and coldness of the extremities followed.

The emaciated, ghastly appearance of the patients on admission, after the third or fourth day of the attack, made me doubt their history of the disease, till it received confirmation from several cases that occurred, amongst the attendants and patients in the hospital. It was evidently contagious; one man attending on his friend caught the disease, and lay four days comatose—his brother caught it while attending on him and died—so that, it evidently was not rendered milder by transmission.

Treatment of this Fever.

The treatment was leeches to the nape of the neck, a mercurial purgative followed by an antimonial solution—sulphate of quinine was given, when a distinct remission was obtained; they were generally admitted after the second day, and had delirium on the first accession of the hot stage—and after the second accession they remained dull, rather comatose, with yellowness of the conjunctiva, and sordes

on the teeth. They then sunk into a state of low muttering delirium, with coldness of the extremities; blisters were applied to the nape of the neck, and quinine given alone, when the remission was perfect, and combined with calomel when imperfect. In several cases where the collapse was great, powdered capsicum and quinine were given, till re-action took place. The treatment was then regulated by the symptoms, that appeared. The bowels were kept open by enemata or mild laxatives. Free evacuation was avoided, as it induced very great prostration of strength. I attributed the death of one patient, who was beginning to rally from this advanced stage, to the moderate action of an ounce of castor oil. Hickup was a troublesome symptom in some of the cases, that used the capsicum; it was relieved by effervescing draughts, and assafœtida with a blister to the epigastrum. The gums were affected, but free plyatism was not induced in any case. An inordinate flow of urine was the first favorable symptom, in many of the cases. The convalescence was tedious. A change of air merely to the lines was found very beneficial, in the convalescence of some cases—the following case shows clearly the early morbid appearances. In all that died there was serous effusion, in the brain.

Treatment continued.

Lalloo Syce 1st Troop, has been ill with fever for five days, is now delirious, with great

Case of yel' low remittent fever.

tenderness in both hypochondria, conjunctiva yellow, pulse quick, skin hot.

App: Hirud: xviii. epigastrio.
℞ Tart: Antimon: gr. i.
Subm: Hydr: gr. iii. m. ft. pulv: tertia quaque hora. repetendus.

He died on the accession of the hot stage, thirteen hours after admission.

Sect: cadaveris.—There was a copious, red, serous effusion under the arachnoid, and at the base of the brain. The pia mater vascular, with numerous bloody points in the substance of the brain. The thoracic viscera were healthy, the blood dark and liquid; the liver was enlarged, dark, and friable; the spleen much enlarged. There were no other marked morbid appearances.

This disease has become much milder, and more tractable, since the hot season commenced.

Hepatitis.

Hepatitis is a very common, and dangerous disease; independent of the usual influence of the climate, the disease is connected with the very hot state of the barracks, and in some instances, with injuries received on duty. It appears most frequently after the rains; but it is found at all seasons. During the practice season in the cold weather, it has the strongest tendency to terminate in abscess; pain in the right hypochondrum, increased

by pressure or full inspiration, and uneasiness in the right shoulder are the usual characteristic symptoms. The pulse is quick and hard, but the skin is rarely hot and dry. The sounds elicited by percussion are of the greatest importance in ascertaining the size of the liver, and in assisting in the diagnosis between inflammation of the surface, and that of its structure, and in the progress of some hepatic abscesses. Symptoms of Hepatitis.

In the treatment, the chief reliance is placed in v. s. carried to syncope on admission, and repeated at intervals of twelve hours, till the acute symptoms yield. It is rare to repeat it more than three times, but in one case it was repeated four times to syncope, or till the blood ceased to flow. This, in dangerous cases, I consider the only true criterion of the quantity, as indicated by the constitution, requisite to subdue the inflammation, and v. s. to syncope is invariably my order, when a vital organ is acutely inflamed. The effect of a bleeding to 50 or 60 ounces is most satisfactory, in subduing alarmingly dangerous symptoms, and I never saw any unfavourable consequences result. The largest quantity, that I ever abstracted at one bleeding, was on admission from a plethoric young man, with acute hepatic symptoms, where the liver extended three inches, beyond the ribs, in the epigastrium. Seventy-two ounces were abstracted before fainting was induced—next day the liver was reduced two inches, and he was convalescent in ten, and he might have Treatment of Hepatitis.

Effects of Venesection.

been discharged, in a few days, had he not got an acute attack of rheumatism in the wrists and ankles, from lying in the current of a tattee; these symptoms yielded readily, he was discharged on the 28th day. I bled an old Major in 1835, who had acute symptoms of determination of blood to the head, to 64 ounces before syncope was induced, since then he has enjoyed better health, than for years previously. In general the total quantity of blood abstracted is less, the acute symptoms yield more readily, and the convalescence is more rapid in dangerous cases, when the first bleeding exceeds forty ounces, than when it is under that quantity. In those cases where fainting was induced, before six or eight ounces are abstracted, no benefit was derived from the operation, and instead of being repeated a large number of leeches were applied with advantage.

Whilst acute inflammation is present, nausea is kept up, during the day, by frequent doses of antimonial purgatives, and at night a scruple of calomel and one grain of tartrate of antimony are exhibited with a purgative in the morning, should the bowels not be freely opened. When the active inflammation is subdued, leeches are applied to the side, and two of the following pills given three times a day, till ptyalism be excited, tenderness of the gums is not enough.

℞ Subm: Hydr:
Pil: Hydr:
Ext: Colocynth: Comp: ā ā ℈ i m.
ft. mass: in pil. xii divid: sumat. ii. ter. indies.

After-treatment.

Ptyalism has generally commenced by the fourth or fifth day, after which, there is seldom much uneasiness in the side. The gums are kept tender, for a period proportioned to the previous obstinacy of the symptom; the bowels are then kept open by simple laxatives, with an occasional dose of blue pill.

Diet in Hepatitis.

During the active treatment, merely a little tea in small quantities is allowed, and until the gums are getting well, only an ounce of sago three times a day. After this milk and bread are allowed, and the diet slowly increased.

Blisters are seldom applied with advantage, except there be obstinate pain depending on inflammation, extending to the surface.

Diagnosis.

In the diagnosis of hepatic abscess, much confidence cannot be placed in any single symptom, nor often in any combination of symptoms, during the examination of one day, or even occasionally of several days. All appreciable symptoms are sometimes for days totally wanting, and frequently merely such slight symptoms are present, as are generally found in cases, that do not terminate in abscess. Abscess is more frequently formed, and re-absorbed, or evacuated, than is generally supposed. In some cases, the pus remains encysted for several years. This opinion is formed, from an examination of the previous history, compared with the post mortem appearance of patients frequently in hospital,

Diagnosis continued.

with symptoms analogous to those, which proved fatal, and from the appearance of cicatrices on the liver. This advantage of tracing the symptoms connected with morbid appearances of old standing, can seldom be found except in regimental practice. Protracted convalescence with quick pulse, and the occurrence of uneasiness or pain on slight irregularities of diet, or the exhibition of improper medicine, form the foundation of my diagnosis. As the abscess increases, many auxiliary symptoms appear, depending on its situation. Whilst still in the centre of the liver, diarrhœa, and increased size are generally found, with difficulty of exciting ptyalism. If to these be added the supervention of dry cough, with increase of pain on turning on the left side—or pain in the stomach, with vomiting—or acute or dragging pain on flatus or fæces passing the arch of the colon—the diagnosis of hepatic abscess is pretty clear.

It is frequently fatal without bursting, and always so, when bursting into the peritoneum —one case that was in hospital, last cold season, may be an exception. This case, J. Grogan, Gunner 2d Company 2d Battalion, had long protracted convalescence from fever, with enlargement of the liver, followed by fixed acute pain in the epigastrum, and vomiting, these were his symptoms, on his re-admission, under my charge, on the 28th November 1836—that night, when vomiting, he felt something give way—this was followed by

Probable case of abscess of the Liver.

burning pain in the epigastrum, spreading over the abdomen, tormenting thirst, great oppression of breathing, pulse 144, vomiting constant, he got frequent doses of opium, combined on the 30th with calomel, and he rallied; but as his bowels were costive, he got a purgative, on the 1st December, which produced several very dark, watery stools, but caused a return of the pain in the abdomen, and the vomiting—on the 2d the oppression of breathing was very great, countenance sunk, skin cold, clammy, pulse 142—he got a glass of port wine, every two hours, till he rallied—and the bowels were kept open, by enemata till the 8th—he was discharged well, on the 4th January 1837.

Terminations of abscess of the Liver.

The constant motion, and irritation from coughing, generally causes a fatal termination, when the abscess bursts through the lungs. In one case, that proved fatal in February last, the abscess in the liver had healed, but a large one had formed, between the communication with the bronchia and the diaphragm, which caused death.

Bursting into the colon is most favorable; in one case the puriform discharge ceased, twenty days after the abscess burst, and he convalesced rapidly—I have suspected evacuation in this manner, in several cases, but the diagnosis was not without doubt.

Of puncturing abscesses of the Liver.

An early operation, for the evacuation of the abscess, would be beneficial in many cases,

as it is not very painful, and if carefully performed, not likely to increase the danger of the case.

Treatment of hepatic abscess continued.

The decision of the question, whether an abscess can, or cannot be re-absorbed, is very important in a practical point of view, as one of two opposite modes of treatment must then be selected, either to give tonics to make the abscess point, and to support the strength, so that when it bursts, the discharge may not exhaust the weakened constitution—or to continue efforts, for its re-absorption, which are of an antiphlogistic nature. I adopt the latter, till the abscess is pointing, then support nature, and alleviate distressing symptoms, till it burst, and afterwards give tonic medicines, and more generous diet, with a little blue pill occasionally, the constant motion during a march is very unfavorable to cases of hepatic abscess.

Of Hepatitis in Natives.

There have been two cases of hepatitis amongst the natives of the Brigade, and I have now a third case under treatment; the first was caused by a blow, abscess followed, and he died. From the appearance of cicatrices radiating from the abscess, the liver must have been extensively lacerated by the injury. In the other two cases, the symptoms were very analogous to those in Europeans, and they yielded—though very slowly, to local depletion, and mercurial action. They were of some days standing, and had used inert remedies previous to admission.

Small Pox has been very prevalent during the last cold season ; it has appeared under all the circumstances, that are supposed to guard against its attacks, viz. in those who have had the disease naturally, and from inoculation, in those who had been vaccinated, and in those who had resisted vaccination, some weeks previously, and in one child under two months of age. Many had neither been vaccinated, nor inoculated. The eruptive-fever was slight in some, and not much modified in others, who had been vaccinated or inoculated—in these the eruption was generally scanty, though in two cases it was confluent on the face : several cases in one family, and many isolated cases occurred, there was nothing peculiar in the treatment. Of Variola. Attacks the vaccinated and inoculated.

There were thirteen cases amongst the Europeans, one of which proved fatal, and ten amongst the natives, all of which recovered.

Venereal.—There are a great number of cases of these diseases, which may in part be attributed to the want of a lock hospital ; the prostitutes are carefully examined once a week, and tickets given to the healthy ; but as the sick are treated as out patients, they may, and frequently do disseminate their diseases. Venereal affections.

Gonorrhæa is treated by antimonial laxatives, with leeches to the perineum, and spoon diet, till the active inflammation is subdued ; Gonorrhæa.

then cubebs given, or sulphate of zinc injections used, with more generous diet. There have been sixty-seven European, and two native cases.

Ulcers and their treatment.

Ulcers are very common; they are generally inflamed on admission, and treated antiphlogistically with antimonial laxatives, and spoon diet. In a few cases v. s.; and in many, when there were buboes, leeches were employed, and when the sores became indolent, mercury was given to affect the system; this was seldom requisite. The local treatment depended on the appearance of the sores, at first poultices, then black wash, and occasionally calomel in powder.

There have been one hundred and thirteen European, and twenty-three native cases, and two cases of secondary symptoms. In patients who had the primary disease, before arriving at Meerutt, I believe several of these sores were induced, by the intentional application of irritants, they have become less frequent, since several suspicious cases were treated with an antimonial-assafœtida mixture; these are the only cases, that I have suspected of being simulated.

Injuries in the European and native constitutions.

An excellent opportunity is afforded, in the Horse Artillery, of contrasting the local and constitutional effects of injuries, in the Europeans, and natives. There are about four hundred of the former, and fifteen hundred

of the latter, under medical charge, and similar accidents are frequently admitted at the same time, in young robust men apparently under similar circumstances, in every respect. In natives the pain, swelling, and redness are less marked, and the constitutional disturbance very frequently imperceptible, always much less developed, than in Europeans; in whom similar inflammation produces high symptomatic fever. Bruised injuries, such as bites very readily proceed to sphacelation in natives, and the loss of substance is slowly repaired: the sores are very apt to become indolent. From the slight constitutional disturbance induced, natives recover from much greater disorganization, or extensive wounds than Europeans. This may in part be accounted for, independently of the sympathetic affection, either alone proving fatal or producing great prostration of strength, by the consequent inflammation not being so great, and therefore not producing such extensive additional local disorganization. On this account, on natives, surgical operations are performed with comparatively little danger, and some may be performed, that are considered too dangerous to be attempted on Europeans.

Contrast between the European and native constitution.

Facility with which natives recover from wounds.

The effect of remedies is analogous in both; but most powerful in natives, particularly that of purgatives and emetics, when free action causes a proportionately great prostration of strength. Great attention must be paid to this, in the advanced stages of severe fevers. The

The effect of remedies.

energy of the treatment required for natives bears a similar proportion to that required for the French, which the treatment required for the French does to that required for the English. The following cases may serve to illustrate what has been here advanced :

Case of stricture with extravasation of urine.

A syce was admitted on the 8th June 1834, with extravasation of urine, from stricture of the urethra causing hard, inelastic swelling of the scrotum and pubes, round the root of the penis ; the parts were cool, and not very painful, p. 80. T. clean and S. cool. A flexible catheter without the stilette was passed into the bladder, and retained—twenty leeches were applied, and a purgative given.

9th. Parts more tender—no fever. Twelve leeches were applied, with fomentations.

10th. A small opening formed at the left side of the scrotum, through which a large quantity of pus and urine escaped. There was crepitus over the pubes, at the right side of the root of the penis. A free incision allowed the escape of a quantity of air and pus.

A catheter was retained in the bladder till the 24th, no urine escaped by the wound after the 16th. A catheter was occasionally passed for some days, and he was discharged well, in the beginning of July. In 1835 he was admitted with an ulcer on his leg, he had never

suffered any inconvenience in passing his urine since his discharge.

Cases of severe lacerated injuries in natives.

Another syce in 1835 had the penis pulled out from the root of the bulb and ascending rami of the ischium, by a horse—and another in 1837, had the left side of the scrotum, and the left testicle torn away, also by a horse—and in neither, was there any constitutional disturbance.

Case of stricture with extravasation of urine in an European.

A. B. æt. 35, Gunner H. A. admitted on the 10th June 1834, complaining of a painful dark swelling, about the size of half a hen's egg, situated at the root of the penis. It appeared last night, after he felt something *give way* in coitu—he passes his urine freely, general health good—leeches were applied, with cold lotions and a purgative given. It remained rather painful till the 15th, when after some difficulty in passing his urine, it became extravasated round the tumor, which enlarged and became very painful with fever, p. 96 sharp, T. white S. hot—twenty leeches were applied, and antimonials given ; they were repeated next day, as no improvement had taken place on the 17th, the swelling was freely laid open, urine escaped from the wound for several weeks, and he remained long very weak ; he was discharged well on the 13th September. During a march to Agra in October, difficulty in passing his urine returned, followed by the wound re-opening, and he again came under my charge in June 1835, with the urethra at

the anterior part of the wound completely closed, I was attempting to re-open the passage by caustic, when sickness obliged me to go to the hills. A syce was admitted on the 8th June 1835, complaining of having received a kick from a horse on the right knee, the wound was an inch and a half long, communicating through a longitudinal fracture of the patella, with the inner joint. A quantity of blood and air was pressed out of the joint, there was not much pain, but he was bled as a precautionary measure, the edges of the wound were brought together by adhesive straps, and the muriate of ammonia lotion applied, the leg was put on an inclined plane; there was slight pain in the liver, for several days, for which leeches were applied, but no constitutional disturbance. The Patella apparently united, and he was discharged quite well, on the 10th August.

Case of severe injury of the knee joint in a native.

Natives generally have an aversion to entering Hospital. Those not obliged to attend regular regimental duty seldom apply for advice, till their diseases are far advanced. Many natives unconnected with the Brigade apply for assistance, under similar circumstances, when their Hakeems have failed to cure them; they do not like vaccination; here small pox is a common disease. A few scrophulous and calculous cases occasionally appear; I have removed four calculi, three of them with success, and one fatal from hœmorrhage, when straining at stool, three weeks

Natives dislike entering Hospital.

Struma and Calculus.

after the operation: this happened during the rains, he had suffered from remittent fever before, and it returned some days after the operation. Leprosy is a common disease amongst the poorer classes. The Mudar (asclepias gigantea) appears to arrest its progress, and heal the sores, but the cure is merely temporary. It commences like the Paraplegia Adultorum of Earle, with loss of sensation, and motion of the extremities. In most cases irritating the ulnar nerve at the elbow, causes a painful tingling to the end of the fingers, as in cases where the Paraplegia depends on an affection of the medulla spinalis. Under this impression, I have applied blisters to the nape of the neck and apparently with advantage; but as the patients were not connected with the Brigade, I could not trace their future history.

Leprosy.

Dracunculus is not an indigenous disease; but I have seen it, in native merchants, who travel much; one worm moved, for several seconds, after it was extracted.

Dracunculus.

Cataract is very common; I have couched here, and in the hills, almost fifty eyes, most with success. I saw a number of cases of deafness, in the hills, caused by cerum accumulated in the meatus externus. Most were cured by its removal; one boy, about 12 years of age, had been deaf and dumb from birth. I removed a plug of dark, hard wax from each ear, and he heard with the right. The

Deafness not uncommon in the hills.

slight constitutional disturbance excited by extensive disease, on the surface of the body, in natives must be born in mind, when a similar extent of constitutional disturbance is excited by internal disease.

On the effects of change of climate from the plains to the hills.

As I have had an opportunity of observing the effects of change of climate to the hills, on the officers and men of this Brigade, and as I twice went to the hills on sick certificate, where I attended many of the sick, I may be allowed to offer a few observations on that subject. During the cold season the climate is very cold and invigorating, and during the hot season cool, pleasant and healthy; during these two seasons it is equal, if not superior to any European climate for most of the diseases of this country. During the rainy season, it is damp, chilly and unhealthy. Most of the recent serious cases remain stationary or fall off during this season, whilst many old Remittent, Rheumatic, or Dyspeptic cases have relapses. Though unhealthy, in comparison with the other seasons in the hills, or with a European climate, still it is much superior for all remittent, and dysenteric cases, to the hot damp climate of the plains, during that season.

Principally beneficial in recent cases.

The greatest advantage is derived in debility, arising from acute attacks, in men lately arrived in the country. A residence during the hot and rainy seasons, generally restores them to their original vigour, which

is confirmed, by the next cold season in the plains. But in extensive organic disease of long standing, and in dangerous attacks of old residents, the above period is insufficient to produce a permanent renovation, in the weakened constitution. In many of these, cases the bracing cold season has been of the utmost advantage.

Inferior to the climate of some parts of Europe.

Including the whole season, the climate of Landour or Simlah is superior, in no case of disease, to that of various parts of Europe, and it is inferior, in several of the common diseases of this country. The high elevation, and the great power of the direct rays of the sun render it inferior, in some pulmonary, and cerebral diseases, and the periodical rains in rheumatism, and extensive, long standing, organic disease, induced by remittent fever; dyspeptic patients, particularly old residents in India, suffer much from torpor of the abdominal viscera, during this period.

Climate of Kunawur.

The periodical rains, the only unfavorable season, in the hills, for Indian diseases, may be avoided by crossing the snowy range to Kinour, where, by residing during the rainy season, at Soognum or Naiko, (villages 23 and 25 marches from Simlah,) a climate may be enjoyed drier, and cooler, than an English summer; so little rain or moisture falls that the soil is incapable of supporting vegetation. The country is formed of a succession of steep, brown, barren stony mountains, without a

Climate of Kunawur continued.

tree, and with scarcely a trace of vegetation, except along the channels of the torrents formed by melting snow, on comparatively level ledges; near these the inhabitants, by hard, and incessant toil, form level beds, which by irrigation afford a scanty subsistence. This *dry*, cool climate is more favorable to some of the Indian diseases, than any trans-marine climate, with which I am acquainted. This opinion is founded on the decided benefit derived here, in many diseases, during the hot winds. It is, as has been already mentioned, *dry* as well as cool, and on this depends its beneficial effects, as heat combined with *moisture*, in this country, as in all other tropical climates is unhealthy.

At Naiko the beneficial effects of the dryness are not diminished, by the debility induced by great heat, neither are they counteracted by a hot damp season following, as in the plains. This opinion is supported, by the inhabitants not being subject to those diseases peculiar to such climates; and in part confirmed by the result of my own, and a few other cases, that have tried it. I would not recommend the invalid remaining there, during the winter, as the country is much under snow, and the necessaries of life are expensive, and procured with difficulty. He should leave Simlah, in the beginning of June, and return in the beginning of October.

NOTE

ON THE FOREGOING REPORT

BY

MR. SUPERINTENDING SURGEON PLAYFAIR.

THE remarks of Dr. Murray, are correct to a certain extent, as they concern the climate of the hills; in some points however I am scarcely prepared to concur with him.

On the Climate of the Sanitary Stations at Simlah and Mussooree.

He says, that during the rainy season, it is "damp and unhealthy," and also "chilly." The climate is damp, so is almost every place during this season, but chilly, it is not, the temperature is too high, too mild, much too equable, to produce chilliness. It is not "unhealthy." It does not affect the sound, and only in a very few instances the diseased. As a proof of this, the sick list does not increase, on the contrary, the amendment continues progressive throughout that season. The equability of the temperature, although combined with moisture, is favorable to pulmonic, and even more favorable for rheumatic cases, than the variable and changeable climate of Britain. It is decidedly more favorable in strumous affections, than that of Europe, and more so, in such pulmonic affections, as incipient phthisis,

Climate of the Sanitary hill Stations continued.

and asthma. During the first year's residence in the mountains, those who have suffered from severe intermittent fever, with enlarged liver and spleen, have generally, at the commencement of the Rains, a few febrile paroxysms, which however yield without difficulty, and it is not found, in their second season, that the same cause produces the same effect. Patients similarly situated, on their landing in England, suffer in the same manner, on their first exposure to damp and moisture, and the climate of the Hills is greatly superior to that of Europe, inasmuch, as most obstinate diseases contracted in Arracan, and elsewhere, have not resisted the influence of two seasons; whereas the Soldiers from the Walcheren expedition, even in the climate of Britain, hardly ever recovered, so far as to escape an attack of intermittent, if exposed to cold and moisture. Almost every case of intermittent fever in the Edinburgh Infirmary used to commence with these words. "An old Soldier; was in the unfortunate expedition to Walcheren; has ever since on exposure to damp and moisture been subject to attacks of ague;" this too, in men, who had resided in Britain, ever since that expedition! I naturally come to the conclusion, that the climate in the Himalyah mountains cannot be considered as unhealthy in the rainy season, although it may not be deemed equally sanitary, as at other seasons of the year. It would be well worth the trouble to ascertain, in the comparative result of practice in an hospital in Britain, (Chat-

ham for example), where men are received for diseases contracted in the West Indies, and I may be allowed to express my doubts, whether it would prove equally favorable even with the advantage, which the patients in the latter have of a previous sea voyage. The above remarks are confirmed by the experience of one of the most zealous members of the profession, and whose experience has been most extensive. I allude to Dr. Robertson, who has had medical charge of the Sanitarium, for a number of years.

FINIS.

G. H. Huttmann, Bengal Military Orphan Press.

Sketch

of the Roads, Bungalows, &c. between the Stations of

ALMORAH LOHOGHAT

and

PETORAGUR

Gurkha Camp
Gurkha Camp
Gurkha Camp

GENERAL

AND

MEDICAL TOPOGRAPHY

OF

Kalee Kemaoon and Shore Valley,

WITH

SKETCHES OF THE

CANTONMENTS OF LOHOOGHAUT AND PETORAGURH.

AS ALSO OF THE

ROADS, RIVERS, BUNGALOWS, &c. OF PART OF THE DISTRICT.

By Asst. Surgeon Wm. DOLLARD,
7th Regt. Native Infantry.

Printed by Order of Government.

CALCUTTA:

G. H. HUTTMANN, BENGAL MILY. ORPHAN PRESS.

1840.

Rx. c. 66

915.4
$01/Gen

MEDICAL TOPOGRAPHY

OF

Kalee Kemaoon & Shore Valley.

The Cantonment of Lohooghaut, in the Province of Kalee Kemaoon, in 29° 24′ north latitude and 80° 5′ east longitude, is situated in the valley, distant from the Burmdeo Pass, about 30 miles, and six from the ancient city of Champawut.

It is bounded on three sides, north, east and south by ranges of mountains, which rise above the valley from 1,000 to 1,500 feet, as also by streams, which fall into the Racessa or Lohoo river.

To the west, the longest extremity of the valley, extending in that direction about two miles, it is quite open. In figure it appears to form nearly three-fourths of a circle. The supposed elevation is about 5,562 feet above the level of the sea. Fort Hastings, situated to the west, is distant from the cantonment about 3½ miles; it is a small and neat fort, but very useless as a means of

defence, for the post. It is built on a conical shaped hill, height above the level of the sea 6,240 feet. The guard consists of one Havildar, one naik and 16 sepoys, who are relieved weekly. This duty is much disliked by the men, on account of the great inconvenience to which they are subject, in procuring grain and water. The former they are compelled to get from the lines bazar, and the nearest water (unless at certain seasons of the year) is only to be found at the foot of the hill, about half a mile of steep descent, close to the valley of Bissun on the Almorah road. The guns, attached to Fort Hastings, consist of two field howitzers, two brass six-pounders mounted, as also four iron twelve-pounders, with an ample supply of ammunition. There are no artillery stationed at this post. The features of the mountains surrounding Lohooghaut are on a grand scale. With few exceptions, they are mostly covered with luxuriant vegetation: they exhibit great variety of forms and directions, occurring in chains and terminating in rounded or broken summits. Their sides are steep, and generally very precipitous. The forms and directions of the different vallies round about, are not less peculiar than the mountains which inclose them. The direction of the mountains vary, but the general aspect, from my own observation, appears to be parallel with the plains from east to west.

Of the Geology and Mineralogy of Kalee Kemaoon in general, I regret to say, I can afford but little information, having had but few opportunities of strictly prosecuting these studies; a few remarks, however, from personal observation and enquiry, I may be allowed to offer. For more general information on these subjects, I would beg to refer to a work lately published by Dr. McClelland, who appears to have devoted much labour and attention to them.

Of the minerals, iron is found pretty general and abundant; one principal mine is situated about 8 miles north-west of Lohooghaut. The natives, in smelting this ore, make use of the simplest process. Masses of the ore as taken from the mine, are reduced into very small pieces, and thrown into the furnace, together with charcoal, and the greatest possible degree of heat is kept up, until the metal is quite fused. This is allowed to cool, when the process is again repeated, it is then beat into round balls, of about two seers weight each, and the smelter sells this almost crude metal to the blacksmith, who exercises further labour in bringing it into a malleeable state. The price of the iron on the spot, is a rupee for 8 or 9 seers. The quality of this metal is considered so superior, that if properly wrought, steel equal (if not better) to the Swedish, might be produced from it.

There are also copper and I believe lead mines, but not in the immediate vicinity of Lohooghaut.

The soil of Lohooghaut appears to me to consist of a red ferrugineous clay, intermixed with coarsely pulverised quartz, and in some parts a deep layer of dark vegetable mould; where the ground is low and moist, the soil is so black as to bear some resemblance to rich peat.

I observe that the best and most productive soils are those, which consist principally of a deep brown mould, or reddish loam; of these the gardens of the European Officers are mostly formed. The site of the Cantonment appears to have been very happily chosen, there is abundance of very pure water, issuing from springs and rivers. The former are conveniently placed as regards the wants of the Sepoys of the Detachment. I have not as yet been able to discover either medicinal or mineral waters.

I understand from a Native Officer of this Regiment, who was present at the taking of Almorah in 1815, that the former Cantonment was at Champawut, but owing to the extreme unhealthiness of the place, the Detachment was removed and cantoned at Lohooghaut. Champawut is in an extensive valley, situated a short

distance to the west of the high road from Burmdeo. During the rainy season, the water lays all around for a considerable time, and hence, perhaps, the cause of the great sickness, which prevailed amongst the troops. It is said that the loss of life from fever, &c. was considerable. There are extensive ruins at this place, some few beautifully sculptured, affording a good idea of its former grandeur. The bazar likewise is almost a ruin. A Tuhseeldar resides and holds his Kutcherry at Champawut, he has the collecting of the Revenue and the management of the Police of Kalee Kemaoon; his residence is in the old Fort.

A Detachment consisting of two Companies 7th Regiment Native Infantry, is at present stationed at Lohooghaut. It may be as well to premise, that the health of the men of this Regiment on their arrival in the hills, was in general very bad, their constitutions were impaired, and their physical strength much reduced from the effects of a severe epidemic fever, which prevailed to a very great extent at Goruckpore, during the hot season of 1834. The corps did not arrive in the hills till the beginning of March 1835, and the weather at that advanced period of the year, being comparatively mild, the men would soon have recovered their strength; but this was in some measure protracted in consequence of their

suffering for a short time in common with the European Officers and their families from complete loss of appetite, and disrelish of food of every kind, attended with acidity of stomach. To what I am to attribute this circumstance so singular from being so general amongst us new-comers, I still feel at a loss to conjecture; unless it may have arisen from some peculiarity of climate, or change of water, the latter I should say was the most probable. With regard to the climate the seasons occur in much the same order as those of Upper Hindoostan. The temperature during the year is comparatively low. The following Meteorological Register formed from observations made by me during the last two years, may be considered as correct. The temperature of Lohooghaut is considered some two degrees lower than that of Petoragurh. Two thermometers (exactly agreeing in their indications) were used in taking the degrees of temperature. They were placed in an entrance room with doors constantly open to the north and south.

Year and Month.	TEMPERATURE.								WINDS.					Days on which Snow fell.	Days on which Rain fell.	Dry Days.	Thunder Storms.
	8 A. M.			NOON.			4 P. M.		No. of Days.								
	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	N.	S. E.	E.	W.	V.			
1835. April,.....	69	64 4/5	62	74	68 14/15	63	75	69 1/15	64	0	9	0	0	21	0	13	17	1
,, May, ...	76	69	60	80	74 1/5	62	82	74 3/15	66	0	18	0	0	13	0	14	17	2
,, June,...	74	70 1/5	69	80	73	70	80	73 6/15	70	0	22	0	0	8	0	19	11	5
,, July, ...	73	70 4/5	68	76	73 4/5	69	77	73 1/15	69	0	14	0	6	11	0	24	7	0
,, August,.....	73	70 3/5	66	78	73 3/5	68	77	70 4/15	61	0	9	0	1	21	0	21	10	0
,, September, ...	71	68 4/5	66	75	72	69	75	72 4/15	70	0	17	0	2	11	0	10	20	2
,, October, ...	67	65	62	71	68 1/5	67	71	69	67	0	12	0	2	17	0	7	24	0
,, November, ...	60	54 7/15	48	64	59 7/15	54	66	61 1/15	58	3	0	0	0	27	0	3	27	0*
,, December, ...	50	41 2/3	30	54	47	38	55	47 7/15	40	14	5	0	0	12	2	4	25	0
1836. January, ...	49	40 3/4	30	55	51 1/3	48	58	55	50	11	3	0	0	14	2	3	26	1
,, February, ...	52	42 3/4	30	68	52 3/4	37	64	50	36	6	2	8	1	12	7	0	22	2
,, March, ...	52	44	38	75	66 1/3	54	71	61 2/3	47	14	6	0	0	11	0	9	22	0
Annual Mean,.....	0	58 1/2	0	0	65 7/12	0	0	64	0	0	0	0	0	0	11	127	228	13

* Frost commenced 15th November.

Year and Month.	TEMPERATURE.								WINDS.					Days on which Snow fell.	Days on which Rain fell.	Dry Days.	Thunder Storms.
	8 A. M.			Noon.			4 P. M.		No. of Days.								
	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.	Mean.	Lowest.	N.	S. E.	E.	W.	V.			
1836. April,	66	62	56	73	67½	64	74	64½	63	0	16	0	0	14	0	7	1*
" May,	74	70½	64	80	74½	67	81	73½	68	0	21	0	0	10	0	2	0
" June,	73	69	66	78	73½	68	80	74	68	0	20	0	0	10	16	3	0
" July,	74	71	68	80	75½	70	77	73½	70	0	10	0	0	13	24	0	0
" August,	72	69½	67	73	73	69	76	73½	70½	0	9	0	0	24	21	0	0
" September,	72	69	66	73	71½	68	72	70½	68	0	10	0	0	11	10	0	0
" October,	66	64	61	71	67	66	72	64	59	0	0	0	0	20	4	0	0
" November,	60	56½	50	66	62½	56	69	56½	52	0	3	0	0	14	0	0	0
" December,	52	44	44	56	55½	50	60	56½	52	12	2	0	0	9	0	0	0
1837. January,	52	44	44	56	54½	53	61	56½	47	15	3	0	0	15	5	0	0
" February,	52	47½	40	58	57½	43	60	58½	52	3	5	4	0	18	6	0	0
" March,	64	60½	48	69	61½	53	72	69½	62	0	0	0	0	0	0	0	0
Annual Mean,	0	61½	0	0	63½	0	0	66½	0	0	0	0	0	3	97	263	22

* Frost commenced 25th November.

Sketch
of the Cantonments at
LOHOOGHAT
To Rusheel & Peters Gaon
To Bhoroghur
Rear Guard
well
Lock Hospital
Bungalow
Sepoys Hospital
Tombs
Grass Godown
Store Room
Sepoys Lines
Bazar
Q.r Guard
Parade Ground
Butts
Water Mill
Road to Burmdee
L O H O O R I V E R

The rains commence generally from about the 10th to the 15th of June, and last till the middle or end of September. I have had no means of ascertaining the quantity of rain which fell, not possessing a rain-gauge, but I should say it was very considerable, and fully equal to the periodical rains of Upper Hindoostan. Owing to the frequency of rain throughout the year, the interior of the mountains is well watered, and the streams in consequence, generally well supplied. The winds are variable. The atmosphere in general is dry, and this place is seldom visited by fogs. The air is extremely clear after rain falls. During the hot season, an unpleasant haze exists, obstructing the view and rendering objects, even at a short distance, very indistinct. In the rains the clouds hang over the tops of the surrounding mountains, sometimes descending into the station, but seldom remaining for any length of time. Over the deeper vallies, however, they often form with such astonishing density, that to a spectator in the clear air on the mountain top, they resemble the waves of the sea, and sometimes have the appearance of a calm lake. I have witnessed this effect frequently, and their beauty can scarcely be imagined ; however, on the rising of the sun the clouds are displaced, and pour down into the different vallies, carried along with amazing velocity by the currents of wind. To those who encounter these clouds, in their transit across the mountains, their humidity is far

from agreeable, equalling what is usually termed a Scotch mist. Thunder storms during the hot weather, are pretty regular and prove very refreshing, cooling the air, and rendering the atmosphere clear; whilst they last, the currents of air, appear to go in different directions, as may be observed by the opposite drifting of the clouds. Whirlwinds are common, but not very severe.

The climate of Lohooghaut, is, I should say, decidedly beneficial both to European and Native constitutions, more particularly to those who have suffered from diseases incidental to a Tropical climate. In this I consider it far superior to either Almorah or Petoragurh. The diseases which have come under my observation as peculiar to this place have not been very numerous. Fevers of the remittent and intermittent forms, prevail during the hot weather and rains. The former is, I think, in a great measure, to be attributed to the late period of the year at which the Sepoys have to pass through the belt of Terai, at the foot of the hills, on their return from furlough. The precise cause of the unwholesomeness of this forest, it is scarcely necessary for me to comment much upon, as it is already so well known. Suffice it to say, that the extensive accumulation of decayed vegetable and animal matter, in a state of putrefaction, must necessarily give rise to malaria, in its most concentrated form;

rendering a passage through this forest from the month of April to the latter end of November most dangerous, especially should rain fall during the early part of the season. Two Officers in passing through it, from Almorah via Bamouree, in the early part of last November, were seized with fever, and narrowly escaped, after a very dangerous and protracted illness, from the effects of which one, or I believe both, still suffer. Dysentery, diarrhœa and rheumatism, are also of common occurrence, chiefly, however, owing to the parsimony of the Sepoys, not affording themselves the necessary clothing, to protect them from the severe and piercing cold which prevails during part of the year. A few cases of cholera, as also of small pox, have occurred. The latter however have been particularly mild—I have not had an instance of the severe, or confluent form. One case of spasmodic cholera terminated fatally, owing to the man not having been sent from the Lines to the Hospital for 24 hours after he was taken ill,—he was dying when he arrived, and ceased to live shortly after.

The cases of cholera, as also the frequency of diarrhœa, and other disorders, of the digestive system, which have occurred amongst the men of the Detachment, are also, in my opinion, to be attributed to the bad, and very unwholesome quality of the rice, brought in to the Line godown. It is rendered

deleterious, from the circumstance of the villagers invariably reaping it before it is quite ripe. In consequence of a smaller supply than usual of wheat being brought in, this description of rice was served out to the Sepoys, and I have had great cause to remark the serious, and in some instances very dangerous, effects produced from eating it. The villagers themselves frequently suffer, but (perhaps from their being accustomed to this kind of food) its effects are less injurious. They assign as a reason for cutting the rice thus early, being obliged to leave for the Terai, at the commencement of the cold season, where they have to prepare ground for their winter crop; and further, that their ancestors had always done so before them. Another, and very general cause of the above diseases, is, in my opinion, owing to the grain being supplied in too fresh a state, that is to say, within a month or less after it is reaped, —no quantity of old grain for immediate use being kept in store, as is generally the case in the plains.

That peculiar affection of the thyroid gland termed goitre, has occurred in many instances, amongst the men of the Detachments, both at Lohooghaut and Petoragurh. After many unsuccessful trials I have at last succeeded in finding a remedy for the removal of this unseemly and troublesome disease. Several cases of long standing, and very considerable

size, have in the end yielded to the plan of treatment I adopted. Some are still under cure, and I intend shortly communicating the result and treatment. Small-pox amongst the natives of the hills, is at some seasons very prevalent, and often commits great ravages. They appear greatly averse to having their children vaccinated. Measles also occur—one would naturally be led to suppose, that the inhabitants of Kalee Kemaoon would enjoy robust health,—the contrary is, however the case, and this I chiefly attribute to their great want of cleanliness, in their persons and the filthy state in which their villages are allowed to remain, both prolific causes of disease. They suffer greatly from ophthalmia in its most acute form, such is the violence with which it makes its attack, that unless immediate medical aid is afforded, the eye is irretrieveably lost, if not checked within the first 48 hours. Such is the rapid progress of this disease, that it generally ends in complete disorganization of the internal parts of the eye, and rupture of the cornea. I have seen several melancholy cases where the persons have been brought in too late for me to afford them any relief; it spares neither age nor sex. The remedies which I employed successfully in subduing it were bleeding from the arm, or temporal artery, repeated according to circumstances, calomel and opium purgatives, and keeping the patient in a constant state of nausea by the tartar

emetic solution, dividing the engorged vessels of the conjunctiva with a lancet, and keeping cold applications constantly to the eye. Blisters were also necessary. I have also tried the solution of nitrate of silver, with the best possible effects. Fevers amongst these people are also prevalent, owing principally to the nature of their avocations, leading them into the lower vallies, whose noxious vapours during the rainy season, equal those of the Terai. These are generally of the remittent, and continued forms—intermittent fevers also prevail, and cutaneous eruptions to a very great extent, as may be supposed from their dislike to cleanliness ; cataract also amongst the aged is general. It does not appear (from enquiries which I have made) that there are any native medical practitioners in this part of the province, and the natives invariably apply for advice to the European Medical Officer.

The Hospital at Lohooghaut is well situated, and is a very large, airy stone building, roofed with slates and boarded throughout. The accommodations consist of one long room with two fire places, and an open verandah of considerable width all round, attached to which are wooden jhamps. The doors and windows are numerous, and well adapted, both for ventilation and protection from the cold air. The furniture for the sick is similar in every respect to that of Native Regimental

Hospitals in general. Near to the entrance at either corner of the verandah, are two small rooms for the purposes of keeping and preparing medicines for the sick. The ground about the Hospital is perfectly free from jungle or other substances, likely to prove injurious. A good cook-room is attached.

I have never met with any snake of a dangerous description during my residence in the hills. Centipedes and scorpions are also rare. I have seen only a few instances of injuries caused by the latter: they are also considerably smaller than those met with in the plains. The most troublesome animal (although not generally dreaded) is the leech —it is of very small dimensions, not exceeding an inch in length, its skin is smooth, glossy, of a dusky brown colour; when in a state of rest it is exceedingly minute, resembling a mere speck. It appears to possess considerable powers of extension and contraction. It is pointed towards the head, and very broad towards the tail. When in motion, the back is elevated, and it measures the space it passes over, like a compass. It is found during the rains, and attaches itself in great numbers to the legs and feet of men; they also prove very troublesome to horses, cows, sheep, dogs, &c. making their way up the nostrils, and adhering with such tenacity, as to be removed with great difficulty, causing such animal to become extremely thin, from the irritation and

loss of blood which they occasion. A most singular fact which I have remarked is, that these leeches when taken for Hospital purposes, cannot be induced to fix upon the part required. I have myself repeatedly tried them in several ways, but never could succeed. Their bites are very troublesome, causing distressing itching, and occasionally in some constitutions, a very irritable and painful description of ulcer. Can this be the leech referred to by Baron Larrey in his Memoirs on Military Surgery, vol. 1st, page 359, as proving so distressing to many of the Soldiers of the French Army, and in some instances ending fatally, with those who imprudently drank from the streams?—he also mentions this leech having been met with in the Island of Ceylon.

Called by the natives Rog.

The horned cattle are subject to an epidemic which occasionally gets amongst them, destroying great numbers, and proving a source of great loss to the native inhabitants. It has prevailed to some extent this season. I have seen some of the diseased cattle. The following are the symptoms. It is always preceded by shivering, and general tremor, a drawing up of the limbs and flanks, the animal refusing the usual food and drink, the head droops, and the coat becomes rough; to this succeeds fever, with a burning heat of the horns, and dryness of the mouth and tongue. The eyes are red and watery. The

bowels are obstinately constipated. These symptoms continuing for 2 or 3 days, the contents of the bowels are spontaneously discharged, and a diarrhœa sets in; the matter passed is dark and offensive, and the animal sinks rapidly. It is highly contagious in this stage. The Natives, although aware of this circumstance, with their usual apathy, seldom take any trouble to prevent the extension of the disease, by separating the animal affected from the healthy. They affirm, that it was, and is, generally imported from the Terai, where they take their cattle to graze during the winter months. My opinion is, that the disease is caused by the cattle being allowed to feed amongst the rank weeds and luxuriant grass, which springs up in the lower marshy vallies, after a heavy fall of rain, succeeding to very hot weather. The following circumstance serves to convince me of the correctness of the above opinion. For some time after my arrival at Lohooghaut, I lost a number of sheep and goats, particularly the latter, (the other European Officers were also equal sufferers) without my being able to discover the cause. The disease which destroyed them, resembled in every particular symptom the *rot*,—some however, died within an hour or so after they were observed to be ill. I opened several of the sheep and goats, and found the stomach full of undigested matter, and much inflamed; in some parts ulcerated and slightly gangrenous, immense

numbers of the fleuk worm (fasicola hepatica) also adhering to the mucous coat of the stomach, and on the surface of the liver. On enquiring particularly, I ascertained that my shepherd had been in the daily habit of taking them down into the low marshy vallies to feed them; in which abound long rank grass and weeds of several sorts, including a great variety of the crow foot or ranunculus species. One in particular, the ranunculus lingua, or great spear wort, flourishes luxuriantly, which I find was eaten with the greatest avidity by the sheep and goats. To this very acrid plant, I attribute the loss I sustained, for on my directing the shepherd, to take them to graze on the higher grounds, the disease ceased, and I have not lost another. The stem of this plant is thick, height about two feet, leaves with little or no stalk, bears large yellow glossy flowers, which spring from the extremities of the shoots. Seed buds prickly. There is another kind which is likewise eaten greedily by sheep, &c., and attended by similar poisonous effects, namely, the butter cress, or bulbous crow foot (bulbosus), every part of this plant is highly acrid and corrosive, and likely to have assisted in causing the effects which I observed in the stomach of the animals I examined. Thus the commonly received opinion, that animals from instinct will invariably reject what is noxious, does not appear to be founded on fact, as I have observed that cows and sheep

readily seek out this kind of pasture. My plan is, immediately to give the sheep or goat thus attacked, a dose of common mustard oil (about 2 ounces). If the animal survived till the following morning, 1½ ounces of common salt, dissolved in a pint of water, was given and repeated for three successive mornings on an empty stomach. The powdered bark of the febrifuge swietenia was given at intervals in quantities of 3 drachms, as a tonic. Under this plan of treatment, I succeeded in curing several. The disease as I mentioned above, as occurring occasionally amongst the horned cattle, would I think, equally admit of cure, and I should certainly have tried the experiment, had any of my own unfortunately been attacked. The natives leave the disease to nature, seldom attempting any thing in the shape of relief—attributing this, as also most other diseases, to fate.

The natives of Kalee Kemaoon in general are perhaps more remarkable for their activity and pliancy of limb than for any great muscular power. They can better undergo a continued rather than a great exertion. They appear averse to agriculture, and much prefer trading which yields them more immediate profit. The common dress of this people is extremely simple, consisting of a sort of jacket, to which is attached a plaited skirt, reaching to the ancles with a small chintz cap

for a head dress. The women wear a kind of boddice, generally of coloured chintz, with a full plaited petticoat, but unattached to the boddice ; over their heads they throw a duputtah. Their ornaments are few, similar to those worn by the same class of Hindoos, in the plains. The marriage ceremonies, from all I can understand from the natives, (who appear averse to giving any information respecting their domestic affairs, owing greatly to a superstitious dread) are much similar both in manner of conducting and season of the year to those of Hindoos in general. The dead are likewise burned or buried according to cast. Hindooism appears to prevail—the religious establishments are very numerous, chiefly supported by rent-free lands given by Government. I regret my inability to afford any correct information as to the population of Kalee Kemaoon, it appears that no correct census has been taken since 1816; it is alleged that the natives from a superstitious feeling are averse to such a proceeding. On enquiry I understand that there are no documents now extant of the actual population of Kalee Kemaoon, but it is confidently asserted that it has *more than doubled*, since the country has come under the British rule. The villages are picturesquely situated, much scattered, and in consequence of the small extent of arable land generally consist of but few houses. These houses are principally constructed of stone, some of wood, nearly all

raised on wooden platforms, about 5 feet from the ground, under which the cattle are nightly sheltered. From their outward appearance they are commodious; where easily procured, slates for roofing are preferred to wood or grass. The furniture consists of but few articles, and those of the simplest description, —a common cot or two, a few mats, with brass or iron vessels for cooking and eating off, &c. constitute almost the whole. Their principal food, chupatties, made of mudoowah ottah, seldom of wheaten. These are generally eaten with a little vegetable curry or dhall, rice with dhaee, (a kind of clouted milk) or fresh milk is frequently used. Their beverage is water. In depriving the paddy of the husk, they make use of a hard stone hollowed in the centre as a mortar, with a long stick ferruled for a pestle, much similar to that used by the natives of the plains. The people, male and female, are extremely filthy both in their persons and villages. The cloths they wear are seldom removed from their bodies, for the purposes of ablution, and generally allowed to drop off piecemeal. The villagers all about this neighbourhood, leave for the Terai about the middle of November, taking with them their families and cattle; they do not return 'till the beginning of April, when the excessive heat obliges them to leave. On their departure for the plains, they close their houses by blocking up all entrances with stone and mud. One or more old women or

very infirm men remain to take charge of the grain and other effects, during the absence of the several owners,—no instance of robbery of property thus left has as far as I can learn ever occurred, indeed crime of most kinds is by no means frequent. The severe laws to which they were subject under the Goorkah rule, still leaves a wholesome impression on their minds, and is by many assigned as a reason for their comparative exemption from crime. The natives of these tribes are very fond of field sports, almost all classes use the matchlock well. They have a most singular mode of catching fish in shallow waters, which I have never elsewhere witnessed. A man with a large iron sledge hammer strikes with his utmost strength any tolerable sized mass of rock in the water under which he supposes there may be fish, the blow is repeated three or four times as quickly as possible, when the fisherman places his hand under the rock and generally succeeds in drawing forth a number of small fish. I have seen as many as 6 or 7 taken at a time, they appeared stunned by the concussion and thus became an easy prey.

Wells are numerous and conveniently situated as regards the wants of the villagers, they are generally covered with cut stone, some of which are beautifully sculptured. They are however neither clean or in good repair, owing to the indolent habits of these

people. Their system of agriculture is simple and primitive; the cultivation is of two kinds, dry and wet, the former on the sides of hills and the latter in the deeper vallies, where they have a constant command of water. In preparing the ground for dry cultivation, the hills are first cleared of jungle which is burned, then cut into terraces, which are faced with stone for the double purpose of retaining the moisture in the dry season, and of preventing the earth from being washed away by the periodical and other heavy rains. The k,hets thus formed are generally of no very great width, the steepness of the hills not admitting of their being so. The implements of husbandry are much similar to those of the plains, as also the operations of ploughing, harrowing, sowing, weeding, &c. In reaping they leave the stubble very long (for the purpose of allowing the cattle to feed on, as also for manure), merely taking off the heads of corn. The grains cultivated in dry ground, consist of wheat, barley, mudoowah, (a sort of millet) oord, bheet, (a sort of small black bean) Indian corn, &c. &c. The wheat is sown in November and is reaped in May. The barley much the same time, mudoowah, oord and bheet are sown when these two crops are cut. Oats appear to grow remarkably well. I have seen a small quantity grown, and judging from its produce, I should say it would yield a rich and valuable crop.

The wet cultivation is solely devoted to rice; in preparing the ground for this grain, the terraces are rebanked, the water is admitted in sufficient quantities to cover the ground an inch or two, which when well saturated, is ploughed and kneaded with the feet till reduced to a state of mud, when it is levelled and smoothed. The paddy (previously steeped in water till it germinates) is sown, and scattered as equally as practicable. When it has taken root, before the earth has time to dry, the k,het is again inundated, and when two or three inches high it is weeded, and where vacant spots occur, they are filled up from those parts which are too thick. The supply of water is continued until the paddy is full grown. The k,hets are then drained, the grain cut, and allowed to dry. As I have previously mentioned this operation is performed before it is quite ripe. The exposure both to sun and damp, and the unwholesome exhalations arising from these grounds, is in my opinion, another great source of the diseases to which the natives of the hills are subject; both sexes being employed in preparing the ground, &c. &c.

The cattle are mostly small; bullocks and buffaloes are employed for the purposes of cultivation, the roads not admitting of their being used for the transport of grain, goods, &c. The cows when well fed, will yield milk from 2 to 3 seers daily, but those kept by the

villagers, in consequence of getting no grain, only produce about a seer. Buffaloes yield from 4 to 5 seers daily, and if properly fed, I doubt not they would afford much more. The natives make use of the buffalo milk for themselves and families, and occasionally bring it for sale; they seldom milk the cows, leaving it for the calf. Goat's milk they use medicinally, both internally and externally; they suppose it possesses heating properties, and is used by them as an external application in rheumatic affections.

The rate of wages for coolies working in the Station is $1\frac{1}{2}$ annas per diem. The hire from Lohooghaut to Burmdeo, three marches, is 13 annas, each man carrying 30 seers. From Lohooghaut to Petoragurh, 3 shorter marches, the hire is 10 annas. From Lohooghaut to Almorah, 4 marches, they receive a rupee. Coolies are very difficult to be had, and under no circumstances can they be induced to work, unless compelled by the Civil Authorities. Considerable traffic is carried on by the natives of Kalee Kemaoon with the people of Bhootan. They principally trade in the following: taking up from the plains English broad and other cloths, muslins, cutlery, tobacco, goor, Lahore salt, and from this, grains of all kinds. For these several things they receive in exchange, hill ponies or ghoots, (a powerfully muscular and extremely useful animal,) musk, borax,

arsenic, (white and yellow,) rhubarb, amber, precious stones, silijeet, gold, coarse woollens, (the manufacture of Bhootan,) consisting of reshmeeanas, (a sort of Cashmere punkees,) and a narrow kind of coarse camlet. Bird skins, and skins of a variety of the wild sheep and goat of Tartary, chowries, &c. &c.

The trade in borax is very considerable, and highly profitable. Each native (according to his own admission) makes from 5 to 6 rupees clear gain on each load of this article, and for which he finds a ready sale at the foot of the hills. The articles of export from hence to the plains are, grain of kinds, red chillies, turmeric, ginger, (green and dry,) cheretta, various kinds of barks, roots, and herbs, for the purposes of dying, &c. &c. Iron and copper, pomegranates, bay leaf, walnuts, honey, hemp, ghee, wax, oil, hill paper, hawks, safflower, frankincense, &c. &c. The cheretta plant grows in great abundance in almost every part of these hills. The hemp is general, and grows most luxuriantly in some parts. The natives use the leaves for the purposes of intoxication, they manufacture in some villages from the fibres of the stalk, a narrow and very strong description of canvass, sometimes of a very fine texture. It is almost impervious to rain, and sold for a moderate price, 16 yards for the rupee. The manufacture of this particular canvass might be introduced into the plains, with very great

Fruit full size

Section of Fruit & Kernel

Branch of the Shrub from which Hill Paper is made

advantage. It is far superior and lighter for bags, &c. than the common taut procurable in the Upper Provinces. The ghee which is made principally from buffalo milk, is very pure, and to be had at the rate of 4 seers for the rupee.

The paper manufactured in these hills is from the bark of a shrub growing from 4 to 5 feet in height, bearing white flowers at the extremities of the shoots, succeeded by reddish berries, this shrub is called by the natives "burrowah;" as I am not acquainted with its botanical name, I beg leave to annex a drawing of the leaves and seed. The flowers I regret to say had fallen before I had an opportunity of copying them. This paper is generally used and is well adapted for public registers, on account of the peculiar property it possesses in resisting the attack of insects. It is made in the neighbourhood, but the principal manufacture is in the Dhotee country. From 40 to 60 sheets are to be had for a rupee. The poppy (or papaver) grows remarkably well, producing an abundance of good opium. The cultivation of it might I think, be made a source of great profit to Government, ground rent being so very low, and the nature of the soil requiring but little labour to bring it to perfection. Several varieties which I have sown, appear to flourish well. The trees most plentiful on the higher elevations, are the oak, pine, rhododendrons,

horse chesnut, and a numerous variety of other forest kinds.

There are I understand several species of the pine. I have however seen but two. Those called by the natives cheer and deodar. The former is I believe the pinus longifolia. The latter pinus deodara. This last is a beautiful evergreen, growing up in a cone like form, and in the shades of evening much resembling the yew in colour. There are I understand also several species of oak, the leaves of those I have met with differ from the British in being serrated. They bear a small acorn, which is much sought after by bears and wild hog.

Fruit trees are numerous. The apple runs up to a height of about 20 feet, resembling much in form the poplar, it blossoms at Lohooghaut, but does not bear fruit. It produces however a small and acid fruit at Petoragurh.

The apricot (or prunus areminaca) produces a small reddish yellow fruit, in great abundance, more stone than pulp, much similar to the early apricot of Great Britain. Its flavour is indifferent.

The bird cherry (or prunus padus) grows wild, most generally to be found in the declivities ; it attains a considerable height, of a

shrub-like growth with a handsome branchy top, leaves long, large, rough and serrated; fruit small and red, extremely bitter.

Of the plum (or prunus) there are several sorts, some bearing a fine, large and well flavoured fruit, very juicy; there is also a small yellow plum, sweetish to the taste and grows in great abundance. The pomegranate tree grows well in some parts, and affords a pleasant sub-acid fruit. The walnut tree (juglaus) branching out into a large spreading top, furnished with pinated leaves, producing a well flavoured fruit. I have observed two kinds, one without almost any kernel, with a very thick shell, which is not eaten. In the green state it makes a good pickle, and is generally used for this purpose. The other kind is edible. The citron (or citrus) grows well in the vallies, where the fruit arrives at full perfection, there are several sorts. The giant citron (decumana) produces a very large fruit of thick rind, with little or no pulp. The common lemon and orange, (citrus medica and citrus auraertium) are common in the lower vallies, the latter of a very fine sweet flavour, similar to the Sylhet orange.

The white mulberry tree (or morus alba) fruit insipid and sweetish. The mangoe tree grows in the deeper vallies, and produces a small but well flavoured fruit. In these same vallies the plantain also flourishes.

The dwarf wild date is found in great abundance on the sides of the road as you descend towards the Ramessa valley; they bear a small yellow fruit growing in clusters, not eatable. The bay tree and common cassia are also to be found. The cassia has lancellated leaves, the bark resembling cinnamon in flavor, but thicker and coarser. The bay, furnishes the leaf used as a culinary spice, and is called by the natives Tajputh. The pear tree (or pyrus communis) growing as it does in the wild state, is not edible; the fruit has a very austere and disagreeable taste: with cultivation however, I doubt not, it would produce a good fruit.

The fruit bearing shrubs are mostly wild. Barberry (or berberris vulgaris,) rises to a height of 5 or 6 feet, throwing out many stalks from the root, the bark greyish white, with a deep yellow wood internally, stalks and branches thorny, leaves oval, obtuse with slighly serrated edges, blossoms yellow, growing in small bunches, at the wings of the leaves bears a small oval fruit, when ripe of a deep purple red, very astringent and acid. The blackberry (or rubus corylifolicus) bears a small pleasant sub-acid fruit of a dark red colour. The raspberry (or rubus idaeus,) this shrub bears a yellowish berry, being of a sub-acid, cooling and very grateful flavour; it comes to perfection in April and May, and is much sought after by the natives. The

strawberry (or fragaria) succeeds admirably in the European's gardens, bearing a scarlet oval fruit, much larger and of a finer flavour than I have ever observed in the plains, it requires however great care and attention to bring it to the requisite size and flavour. Numbers of the strawberry plant are destroyed by a grub, which attacks the roots; this grub is the cockchafer (or scarabeus melolortha) in its worm state; they burrow under ground, destroying fruit trees and vegetables of all kinds, preying upon the roots; they are about 1½ inches in length, sometimes larger, colour whitish, and about the thickness of the small finger, with bodies composed of segments or joints; the head is larger in proportion than the body, of a reddish colour, furnished with forceps and a semicircular mouth; they have apparently no eyes, but have two feelers, which serve to direct them under ground. This grub, as in Great Britain, changes gradually to the state of insect, when it issues from the ground in the early part of June in enormous numbers, making their appearance at sun-set with a disagreeable buzzing noise, and most unpleasant smell. They attack the foliage of the apricot, peach, plum, cherry, and weeping willow trees, which they quickly destroy, covering the ground with fragments of leaves, they disappear entirely in the morning, betaking themselves again to the ground, to return in equal numbers the following evening. Their visits are

repeated until not a leaf remains. Fowls, ducks, crows and other birds eat them with the greatest avidity. Their visits have been yearly repeated (much about the same period) since our arrival in the hills.

Europe vegetables, of almost every description, are produced in the gardens of the Officers, and are to be had one kind or other in almost full perfection, throughout the year.

The following are most general—artichoke and Jerusalem artichoke, (the former are often attacked by a small black blight, wood ashes scattered over the plants, effectually removes this.) Asparagus (the wild grows in great abundance in the jungles,) and is a singular looking plant, on account of the stalk which is thickly set, with long sharp thorns, in other respects it resembles the garden cultivated asparagus, with the exception of its possessing an intense bitter taste.

French and Windsor beans, cabbages of every kind, including the turnip rooted, which grows to an enormous size, cauliflowers, carrots, turnips, celery, cucumbers, tomatas, lettuces, endives, parsley, fennel, sage, thyme, onions, leeks, capsicum, chillies, coriander, cress of all kinds, garlic, ginger, several sorts of gourds, yams of kinds, mustard, spinach, mint, potatoes, &c. &c. The whole of the above, with proper attention to the seasons, and manner

of planting, arrive at perfection. Potatoes are planted here in March, and are fit for use in August, they are altogether taken out of the ground in October. They afford a very good crop, cuttings taken from the strongest plants and set in rich mould, during the first three or four days' heavy rain in June, produce better and larger potatoes than the other plants. The plants are in no way injured by these cuttings being taken from them.

The mint, (mentha) growing in moist rich ground, is very luxuriant, rising to the surprising height in many instances of 4 feet. The tipparee or Brazilian currant, flourishes in great perfection.

A great number of the common flowers of Europe are to be found growing wild. I have seen several very beautiful specimens of the lily (or lilium.) Roses of every description grow in great abundance in the gardens. Several sorts of English flower seeds which were sown in my garden, came to great perfection —mignionette and sweet pea, in particular. The geranium also thrives very well.

Of the birds which I have met with, I beg to enumerate the following : The golden and brown eagle, the former, a specimen of which I shot, measured 9 feet from one extremity of the wing to the other. I have seen several

species of vulture. A large species of brown owl, measuring three feet across the wings, there are several smaller varieties of this species. A large brown falcon, a very powerful bird. A variety of small hawk. Several of the kingfisher tribe, as also of the shrike. The bulbul, blackbird, and sky hawk, are very common. The green paroquet, as destructive to the crops, &c. as in the plains. The common cuckoo, which is heard for some months. A species of goldfinch. Wild pigeon. Several of the woodpecker tribe. A variety of pheasants. Black, grey, and chikur partridges; quail, woodcock. The latter make their appearance in these hills about the beginning of November. I have shot one as early as the 15th of October; except that they are lighter in weight, they resemble in every particular feature those I have met with in the South of Ireland; they weigh from 9 to 11 ounces. The painted and common snipe. Wild duck and teal are scarce, and seldom met with in the vicinity. I have seen only two sorts of monkey, the large grey with black face, and the small brown monkey. The hares are fully as large as those in England. Rats are very numerous and destructive. The musk rat is occasionally seen, as also the porcupine. The jackall's cry is seldom heard. The fox is about the size of the English, with a very bushy tail, tipped with white. Several varieties of the deer species are found about. The large mountain

cat, as also several handsomely spotted, like the leopard.

Tigers, leopards, and bears are very numerous, and exceedingly destructive, committing great havoc amongst the villagers and cattle. Whole villages I have heard, have been depopulated by the former. Bears commit great depredations amongst the grain, and when any of the natives attempt to disturb them, they generally suffer for their temerity, getting dreadfully lacerated. I have had several cases of very extensive injuries occasioned by these animals. Their principal attacks appear to be directed against the face, and they certainly leave the person so attacked, a very unsightly object. They are like their species in every country in which they are found, very partial to honey, and are exceedingly bold in their efforts to obtain it. The bee of the hills is very small, yielding however a very large quantity of delicious honey. Petoragurh is famous for the greatest quantity and the best, both white and brown being procurable there. Flights of locusts have twice occurred since my arrival at Lohooghaut, they did not alight in any numbers, nor did they cause any damage; their passage was in the direction from North East to South West. The white ant is troublesome, immense flights of them frequently occur after a shower of rain. They are seen to

issue from every part of the ground of an evening, and are eagerly devoured by the birds.

For a copy of the annexed sketches of the roads, bungalows, &c. and of the cantonments of Lohooghaut and Petoragurh, I am indebted to the kindness of a friend. The Post of Petoragurh where a Detachment of the 7th Regt. Native Infantry (also under my Medical charge) is stationed, is distant from Lohooghaut in a northerly direction about 28 miles. The first march to Durgurrah, (where there is a Stage Bungalow) is $9\frac{1}{4}$ miles. The road is generally good and tolerably level, width about 4 to 5 feet, in some parts less. There is a very fine well of good water in the immediate vicinity of the bungalow. From Durgurrah to Kuntagong (the second stage) is about 8 miles, there is also a bungalow at this place. The road from Durgurrah for the first four miles is a gradual and easy descent, from thence however to the valley of Ramessa, the descent becomes very abrupt and precipitous, the road is narrow and winds in a zig zag direction, most laborious to the traveller; at the bottom of this descent, (which is reckoned to be only 1,500 feet above the level of the sea) rolls the Surjoo river, a most impetuous and rapid torrent, dashing over the rocks with the greatest force, causing a deafening noise and casting the spray in all directions.

This river is crossed by means of an iron suspension bridge, of 180 feet span. In this river is caught the highly and deservedly esteemed fish the mahasur. The ascent to the Kuntagong bungalow from the bridge is very considerable, but from being gradual does not appear so precipitous as that on the opposite side. On reaching the bungalow the traveller is amply compensated for the toil and trouble he has undergone by the magnificent view of the surrounding scenery. No description of mine could do adequate justice to its grandeur. The bungalow is picturesquely situated (almost on the verge of a frightful precipice), affording a beautiful view of the Surjoo river, which is seen winding its rapid course through the fertile valley of the Ramessa. The noise of its waters is unheard at this very great height. The surrounding mountains are generally well covered with forest trees of the description I have before enumerated, but the pinus longifolia is much larger in girth, and grows to a greater height between Durgurrah and Kuntagong than I have elsewhere observed. The Thakill peak in the immediate vicinity of the latter bungalow is 8,221 feet above the level of the sea. From Kuntagong to Petoragurh is 10½ miles, the road is generally good, but for the first 2 miles very narrow with a terrific precipice on one side, of some thousand feet in depth. There is one part of the road in particular, which causes an unpleasant sensation of

apprehension to a traveller passing for the first time. Tigers and bears are by no means unfrequent in the dense jungle bordering the edge of this road, the latter I have more than once met with, and in one instance a bear of the large black species stood up on my approach, and appeared evidently inclined to dispute the passage; however he took himself off to my great satisfaction, for being unarmed at the time he would have been an unwelcome and dangerous antagonist. I was at that time returning from visiting my hospital at Petoragurh.

Height above the level of the Sea 5,462 feet.

The Cantonment of Petoragurh is situated on a low ridge in the centre of the valley of Shore. The site has been very ill chosen, almost surrounded as it is by rice khets, the climate is in consequence far from salubrious; fevers of the continued and remittent forms are very general. Dysentery also of an acute form prevails.

The whole of the low grounds surrounding the cantonment is flooded during the rains and where not cultivated, jungle and long grass spring up rapidly. The consequence is that when the rains cease, the powerful rays of the sun cause evaporation from an extensive surface, well supplied with rank vegetable matter in a state of decomposition. To the exhalations emanating from this source the prevalence of the above diseases during

the months of August, September and October is to be attributed. The Officers' bungalows are somewhat elevated above the Sepoys' lines, but this does not appear to exempt them from the influence of malaria. On my visits to Petoragurh after a very heavy fall of rain in passing over the muddy khets, through which the road runs for a couple of miles, I have invariably remarked a very offensive effluvia. The water is much complained of both by Officers and men, it is hard and of a disagreeable flavour, more particularly during the rainy season at which time it occasions diarrhœa.

There is a capital, airy and very comfortable Hospital at Petoragurh, built of stone, with slated roof, boarded throughout, and superior even to that at Lohooghaut. The cultivation is in every way more extensive than at Lohooghaut. Grain in consequence is exceedingly cheap and easily procured. The natives at Petoragurh and all around never leave in the winter season for the plains; the grain is therefore allowed to ripen fully before it is reaped, and is consequently of a superior and more wholesome quality than that to be had at Lohooghaut. The dress, manners, habits of living, &c. of the natives of Shore are similar in every respect to the people of Kalee Kemaoon. Baskets and mats are made from a kind of reed growing in the neighbourhood of Petoragurh. At the com-

mencement of the hot weather the natives annually set fire to the dry grass and jungle, thus serving the double purpose of getting rid of wild animals, as also of procuring better pasture for their cattle. These fires burn with amazing force and pass so rapidly through the dry jungle that loss of human life is not unfrequent. The volumes of smoke are extremely unpleasant, and the heat in some instances in passing near them is almost intolerable. The gardens of the Officers produce vegetables equal to those of Lohooghaut, and from the greater warmth of the vallies, where they are situated, they arrive at perfection at an earlier period.

Fort Loudoun is about 100 yards west of the Sepoys' lines. It is a neat and conveniently situated Fort and commands the whole cantonment; a guard of equal strength as at Lohooghaut, carries on the duty.

The early part of the present season has been unusually warm, the heat has been daily increasing. The haze on the surrounding mountains has been very dense. The season I should say generally unhealthy both at Lohooghaut and Petoragurh. The thermometer at the former place rose to 84° in a closed room. I have never before seen it during my residence in the hills so high. On being placed out in the sun for ten minutes during three successive days, the Mercury

rose to 130°. The atmosphere this season appears to be surcharged with electric matter. In the beginning of May we had several thunder storms attended with very vivid lightning. Measles are now very prevalent amongst all classes.

FINIS.

G. H. Huttmann, Bengal Military Orphan Press.

Sketch

of the Cantonments at

PETORAGURH

A

SKETCH

OF THE

Medical Topography

OF

BISHNATH,

AND ITS IMMEDIATE NEIGHBORHOOD;

WITH AN

ACCOUNT OF THE DISEASES GENERALLY PREVAILING IN ASSAM.

BY

ASSISTANT SURGEON D. A. MACLEOD,

Assam Light Infantry.

CALCUTTA:

G. H. HUTTMANN, BENGAL MILITARY ORPHAN PRESS.

1837.

915.416
mac/ske

MEDICAL

Topography of Bishnath, &c.

Bishnath, its Latitude and Longitude, and altitude above the Sea.

BISHNATH, the head quarters of the Assam Light Infantry, is situated on the north bank of the Burrumpooter, in Lat. 26° 39′ N., Long. 93° 12′ 27″ E., and at an elevation above the sea of 202 feet.

Its distance from Gowalpara, Gowahatti, Terpon and Nowgong, the Stations below it, and from Somhauth and Suddra above, also from Calcutta.

It is distant from Gowalpara, the frontier station in Bengal, about 200 miles from Gowahatti, the principal civil station in Assam, about 120 miles from Terpon, the civil station of the north central division—32 miles and about the same distance from Rungagora, the civil station of the south central division—it is 80 miles distant from Somhauth, the capital of Upper Assam; and about 250 from Suddra, the extreme post on the N. E. frontier, and about 750 miles from Calcutta.

General description of the site of the Station.

The station is situated on a bold rocky point, which jutting out into the river a short distance above, and as suddenly retiring below to the north, forms a considerable promontory of upwards of a mile in breadth. This promontory is again divided by a small nullah to the eastward, formed partly by the inundations during the rainy season, and partly by a small stream called the Booreegong Nuddee, which flows from the Duffalo hills.

Bungalows and public buildings, of what materials composed, with cost of erection, &c.

On a high bank, chiefly composed of primitive rocks (gneis,) from 30 to 60 feet above the highest rise of the river, stand the bungalows of the European Officers, and the Regimental Hospital, having the lines of the Corps behind to the north, and the bazaar to the east along the banks of the small nullah.

The bungalows are constructed of strong timbers, having their walls made of a species of reed (Kugra,) covered outside with grass and inside with bamboo mats.

These houses, though inferior to the style of bungalows common in most cantonments, are nevertheless very well adapted to the country, as they can be erected within a month, or six weeks, at an expense of from two to four hundred rupees, and last with trifling repairs for three years; with the addition of glass windows and doors they form as comfortable a residence as can be desired.

Objections to all the buildings being of a temporary description, and the inconveniences experienced in consequence.

Excepting the Magazine, which is built with bricks, and tiled, all the public buildings and Serjeants' houses are composed of the same materials. The principal inconveniences resulting from these temporary buildings are the necessity of renewing them triennially, and the difficulty often experienced of procuring workmen when most wanted, as at certain seasons of the year when engaged at home on their agricultural labours, the promise of three rupees a month is not sufficient to induce them to work, while at other times, they gladly accept

two rupees, but even at this apparently small rate, labour cannot be said to be cheap, on account of the trifling quantity performed by an individual during a day.

Want of lime, the principal cause for there being so few pucka buildings, public or private.

At Gowahatti some of the public buildings and officers' houses are built with bricks, and it is to be hoped in a few years, pucka* buildings may become common all over the country, as excellent bricks can be made at a trifling cost, the materials for their manufacture being every where abundant. Lime is at present procured at very considerable expense from Sylhet. Limestone is found a few miles above Suddra, but can only be got at in the cold weather when the river is partly dried up, as most of the stones are not much larger than a man's fist, and very round or oval ; the Natives experience great difficulty in burning them in their rude kilns from their falling down and choking the fire.

Hospital well adapted for the purposes required, situation high and dry, and close to the river.

The Regimental Hospital is a commodious building, capable of holding 80 patients, who are ranged on bamboo benches along the sides, upon which they place their usual bedding or mats ; down the centre is an open space sufficiently broad to admit a dooly, and four people to walk abreast. One end is partitioned off, forming a medical store room and a place for the Native doctors, opposite to which is the guard room and a small apartment for the accommodation of Native officers who may wish to be in private : there is an eight feet verandah all

* Buildings of burnt bricks or stone and mortar are called *pucka*, those of unburnt bricks and mud *kutcha*.

round, which is well adapted for the convalescents exercising themselves in, and for out-door patients, which it is often necessary to accommodate with a place in hospital to prevent their dying from exposure to the weather, and from absolute starvation.

It is a melancholy fact that to many of the persons whose lives have been thus saved, and supported for weeks on charity, not a few of the petty thefts on their sick neighbours' property have been traced, and in not a single instance has any of them ever shown the least gratitude for the attentions paid to them or given notice to the Native doctors of their intended departure.

In point of comfortable accommodations the sick are certainly well provided for; the situation of the hospital is in every respect highly advantageous, being close to the river, and having the surrounding ground kept as clear and free from jungle as could be wished.

Burrumpooter, its rises and falls, its depth, velocity of its current, purity of its water, its breadth, best seasons for its navigation; wind almost always blows down the river —storms come on with more regularity than in the Ganges, fewer wrecks in consequence.

The Burrumpooter in front of Bishnath, although considerably contracted by its banks, is never under 800 yards in breadth in the cold season, and a mile and a half, or two miles in the rains, although both above and below not far off it extends in many places to the breadth of from three to five miles; the average rate of the current has been computed at two miles an hour in the cold weather, and at four and a half in the rains. The water during the former period is very clear and free from impurities, but when the river rises it becomes excessively

muddy—it attains its greatest height usually in July and August, falling rapidly in September and October—from December to the end of March it is lowest; in April there are frequent rises and falls, and in May the rise steadily encreases,—the average rise at Bishnath is about 35 feet, and the depth as measured by Lieut. Bigge on 26th October last, opposite cantonments, was from 3 to 5 fathoms, within 300 yards of either shore, and from 10 to 15 fathoms in the centre; these measurements were carefully taken with a regular sounding line correctly marked off, and at the time the river was at least 25 feet under high water mark. Every season new sand banks form, and the river is seldom or ever to be found running two years consecutively in precisely the same channels.

The best season for its navigation commences in October—there are seldom autumnal equinoctial gales: the shortest passages are made in the months of February and March, almost the only season of the year when westerly winds can be surely calculated on. In April and May storms are particularly prevalent towards the afternoon, and at night; although extremely violent they come on with such regularity and are usually seen at such a distance that, comparatively speaking, accidents and wrecks are of much less frequent occurrence than in the Ganges.

General description of the country in the

To the eastward of cantonments on the opposite side of the nullah there is an extensive

immediate vicinity of Cantonments, its uncultivated state possibly affecting its salubrity.

tract of reed jungle liable to inundation, which no doubt detracts materially from the salubrity of the place, but it unfortunately happens that no elevated situation in the country is without similar drawbacks.

On the north, and at the back of cantonments there is a tree jungle of considerable extent, partially cleared, which, it is to be hoped, may soon be brought completely under cultivation, as until such be the case it is doubtful whether it may not in its present state give rise to more noxious exhalations than if left unreclaimed altogether. There are at present not more than about 20 convicts available for clearing of jungle, and for keeping the roads and drains in repair, a number totally inadequate for the purposes required.

Behind this belt of jungle are the celebrated Bishnath plains of immense extent, formerly well stocked with game of all descriptions. A few years ago flocks of red deer, varying in number from 5 to 7 or 800, might always be seen ; now they have become more scarce, having retired to a greater distance inland where they are less liable to be disturbed.

Breadth of the valley of Assam opposite Bishnath.

The valley of Assam, opposite Bishnath, is said to be about 50 miles broad. The Duffalo hills behind being about 40 miles distant, and the Meekur hills in front eight or ten.

The Giant's Peak, estimated by Captains Jones and Wilcox at 21,000 feet high, and the

snowy range of the Himalayas are objects of admiration every clear morning throughout the year.

Neighbouring hills possess no recommendations as sites for a Sanatarium.

None of the neighbouring hills possess any recommendations as sites for a Sanatarium, the climate being remarkable for its changeableness, and access to them being next to impossible from the distance to be travelled through swamps and jungles, and from the being inhabited by fierce and treacherous tribes, highly jealous of the visits of strangers.

Sudder Bazar —amount of the population.

The Sudder Bazar at Bishnath consists of about 140 houses, containing from 6 to 700 inhabitants, the men of the regiment, camp-followers, &c., usually at head-quarters may amount to 1000, giving a total of 1700 persons.

Its bad situation a probable cause of increase of sickness.

The present site of the bazar is most wretched, cramped upon the edge of the nulla, the people are crowded together in a manner highly prejudicial to their health, and are sometimes for a fortnight together obliged to move about from house to house in canoes when the river rises very high; the Regimental Bazar being above high water mark, is not subjected to this inconvenience.

Causes preventing its immediate removal to a better situation.

A more desirable situation on the west side of Cantonments is likely to be fixed on, but such is the apathy of the natives themselves, and the disinclination evinced by them to adopt any improvements even for their own benefit when attended with any expense however trifling, that

the proposed transfer of the bazar cannot all at once be effected.

Description of the houses in the Bazar and country generally.

The houses in the bazar, and those all over the country, are made of bamboos, reeds, and grass, a few are plastered over with clay; those in low situations are raised several feet above the level, of the ground, with mud and clay, they resemble in size the huts of the corresponding ranks in Bengal, but none of them have the circular hog-back shaped chopper which is the favourite mode of the latter, and the villages and houses in general are so surrounded by dense jungle, that strangers unacquainted with the habits of the people, might pass close to a considerable village or collection of houses without ever seeing one of them; this singular custom greatly detracts from the thriving and cheerful aspect that many parts of the country might otherwise exhibit.

Principal trade in the hands of native merchants, inhabitants of Marwar and Ajmeer.

Almost all the trade of the country is in the hands of a set of merchants, called Razas, natives of the Marwar territory, who are dispersed all over the province and make advances either in money or salt to the villagers for the different products of the country. They are also to be found near all the passes from the hills, by which means they procure ivory, gold dust and other valuables in exchange for salt, muslins, chintzes, brass pots, &c. Their profits in this manner would be enormous were there not so many of them to be divided among. It is much to their credit that complaints for the non-fulfilment of their engagements are rarely brought

against them, while Bengalies, under similar circumstances, are considered as a curse wherever they settle themselves.

They convey their merchandize in enormous canoes called hoolungs, capable of containing from 40 to 100 maunds, they are admirably calculated for the river, as with five men they can be pushed along by bamboo poles at the rate of 8 or 10 miles a day, with tolerable certainty, when other boats make little or no progress during the rains, on account of the rapidity of the current, there being no tracking ground, and continued easterly wind which may be said to prevail for nine months of the year.

Seasons, the division into wet and cold applicable to Assam.

The late Dr. Leslie, from whose statistical report of Gohattie I have copied a table of the annual range of the thermometer during the day time, (having never kept one myself so correctly) justly observes—"The seasons in "Assam may be divided into the cold and "wet; for in April and May the rains com-"mence with intervals of fine weather. During "July, August and September the heaviest "showers fall, but even in these months there "are dry days, and the rain seldom falls for 24 "hours without intermission and scarcely ever "for two days."

The first approach of the cold weather is generally perceived about the middle of October, when the mornings and evenings become delightfully cool, but the sun during the day continues intensely hot, fogs now and then occasionally

come on and at a more advanced period from December till March, they are of daily occurrence, often not clearing off till 10 or 11 o'clock. November and March are I think the two pleasantest months in the year, as the heat and cold are then most comfortable to the feelings; in December, about Christmas time, and often in February, rain falls, causing a disagreeable sensation of cold, which is not indicated by the Thermometer.

Throughout the year the nights are tolerably cool, and perhaps with the exception of six or eight in a season, do not prevent people resting with moderate comfort.

The annual mean temperature by Doctor Leslie's report is 72° 86.

Table shewing the mean and extremes of temperature throughout the year.

January	extremes	48° to 73°	Mean Temperature	58° 15
February	ditto	48° to 80°	Mean ditto	60° 7
March	ditto	52° to 90°	Mean ditto	72° 9
April	ditto	60° to 90°	Mean ditto	74° 8
May	ditto	60° to 92°	Mean ditto	76° 48
June	ditto	70° to 91°	Mean ditto	76° 5
July	ditto	76° to 88°	Mean ditto	82° 15
August	ditto	74° to 91°	Mean ditto	81° 52
September	ditto	70° to 90°	Mean ditto	81° 55
October	ditto	67° to 87°	Mean ditto	77° 45
November	ditto	58° to 81°	Mean ditto	71° 0
December	ditto	49° to 73°	Mean ditto	61° 98

By the above table the extreme range of thermometer at Gowahattie appears to have been from 49° to 92°, but at both Bishnath and Somhauth, although not able to give the dates, I have more

than once seen the thermometer point at 45° and 98°.

With regard to the climate of Assam great difference of opinion exists, some affirming that in point of salubrity it is on a par with any in Hindoostan, or at least Bengal, while others judging from their own cases, describe it as realizing in its deleterious nature the reports they had already heard, of its resembling closely that of Arracan.

Climate neither so good or so bad as it has been represented, but better than could be expected.

As is usual in most cases when great differences of opinion are entertained, the truth lies between the two extremes.

The climate in reality is much better than could be reasonably expected judging from the general appearance of the country when the elements of malaria such as extensive marshes, deep jungle, and rich alluvial soil liable to inundation, every where abound, added to which the moist and warm state of the atmosphere, of itself said to be the medium in which miasmatous influence acts most injuriously on the human frame, lead one to anticipate the frequent occurrence of such diseases as are usually prevalent under similar circumstances, which is truly the case in Assam as will afterwards be shewn when noticing the prevailing diseases of the province.

During five months of the year, from November to April, and in very healthy seasons, the latter half of October and part of April may be

Seasons of the year when military operations can be conducted with safety.

included, active operations may be carried on in the field in most part of the country by either Europeans or Sepoys with comparative impunity; but as it frequently happens from unforeseen and unavoidable circumstances, that military operations are sometimes necessarily undertaken in the rains or not completed within the proper time, the most melancholy effects result, few if any escape attacks of fever of the most dangerous type, often proving fatal within 3 and 4 days, leaving those who escape with their lives miserable sufferers for years from a complication of diseases and an annoying tendency to relapses from the slightest exposure.

These remarks more particularly apply to the diseases contracted in the neighbourhood of the hills and passes into the country, which unfortunately are the usual scenes of military operation.

Circumstances under which good health may be enjoyed.

Europeans, or natives, in comfortable circumstances, whose employments do not oblige them to be much exposed to the vicissitudes of climate or to travel through uncultivated parts of the country at unhealthy periods of the year, usually enjoy excellent health, provided they did so previous to their entering the country, but I have seldom known a case of a delicate subject continuing for any length of time in the province without complaining of a sensation of languor and debility, such as he never experienced in Upper India, where the range of the thermometer attains to so much a greater height.

Another characteristic of the effects of climate equally applicable to Europeans as well as the Native Soldiers is the extreme tediousness of convalescence, and tendency to relapses that exist in many cases after severe illness,—caused no doubt by mental depression, great desire to leave the country, the want of a succession of novel and exciting objects, change of scene, &c., and from their continuing probably under the influence of the predisposing cause of complaint, which however desirable to be avoided, cannot always be accomplished.

Tedious convalescence a characteristic of all severe illnesses, its causes attempted to be pointed out.

European children thrive remarkably well; the chief disease they are annoyed with is worms, which often induce attacks of fever and bowel complaint, from which they speedily recover on the expulsion of the exciting cause.

The soil in the neighbourhood of Bishnath, and indeed all over the country, may be said to be very rich; it is commonly of a clayey nature and in many places consists of a rich black loam —the immediate vicinity of cantonments being high ground is not celebrated for its rice crops, but is admirably adapted for the production of wheat, sugar cane, Indian corn and potatoes, &c.

General character of the soil and produce best adapted to it.

The agricultural productions of Assam are nearly the same as those of Bengal—rice, opium, Indian corn, kullai, mustard seed, sugar cane, and it is to be hoped in a few years, tea and coffee may be added to the list. Although sugar cane grows luxuriantly, the natives of the country make no other use of it than converting it into

Agricultural productions much the same as those of Bengal.

goor. Serious doubts I have heard urged against its containing a sufficiency of saccharine matter to make it a profitable speculation, and that the dampness of the climate might possibly prevent its manufacture into sugar altogether—the latter objection is also urged as to the probability of coffee ripening, but I have tasted the produce of a few bushes reared in a garden with the quality of which I was perfectly satisfied.

Climate of the tea country very bad for 8 months of the year.

The tea plant is found in a part of the country where, excepting in the cold weather, it rains almost incessantly; the greatest inconvenience to be dreaded from its culture is the mortality likely to ensue among the workmen, as assuredly for many years to come none but the wild tribes about the place have sufficient stamina to withstand the noxious nature of the climate during 8 months of the year,—but if the present experiments succeed and the jungle gets cleared away, this objection will gradually be overcome.

Horticultural productions.

All the Europe vegetables usually grown in India thrive here very well, and in the native gardens may be seen ginger, long pepper, turmeric, capsicums, garlic and tobacco in great perfection. Oranges, limes, peaches, pumaloes, jack fruit, pine apples and mangoes are all procurable in abundance when in season. All the orange species are of the finest quality, but the mangoes are seldom good, and few are found that are not already half eaten by a species of beetle with short legs, the size of an ordinary English spider. The peaches also are seldom fit to be used excepting in tarts—many of them

Fruit much destroyed by a species of beetle.

rotting on the tree before they are ripe. Pine apples are very good, but they also are subject to the attacks of large beetles that very soon destroy them.

Grain after three months keeping liable to similar destruction.

The most destructive of all insects however is a small beetle not much larger than a flea which destroys rice and wheat in large quantities if kept above three months; in consequence of their ravages it is necessary to keep the rice in husk, under which circumstances with care it may be preserved for several years.

Peculiarity in native taste with regard to fruit.

The natives prefer all fruits in the green state, when they eat them with salt by way of a relish.

Domestic animals, their value, diseases they are liable to, with native mode of cure.

The breed of cattle is very small and give little milk, they cost from 3 to 6 rupees each. The oxen and bhangies (barren cows) when fat make excellent beef,—many of the calves die before reaching maturity,—cattle are occasionally subject some years to a species of dysentery that carries them off in great numbers—the only other complaint I have observed them liable to is an ulceration and swelling of the feet in the rains which often contain maggots and causes the loss of the hoof; from this cause they sometimes die: the natives treat the complaint with applications of lime and tobacco to kill the maggots, and sometimes bind the limb up in hot sand with good effect.

Buffaloes are plentiful; males are often employed in ploughing new ground, and are worth

from 10 to 12 rupees; females sell for 20, 25 and 30 rupees.

Horses thrive very well, the common ponys are wretched creatures,—the better classes supply themselves with Bootan tanghans, which they buy from 30 to 50 rupees; an officer however can seldom procure one worthy of purchase under 80, and often as high as 120 rupees. Sheep and goats thrive well, the former are always procured from Bengal, no native ever keeps them; the latter, with a little trouble in procuring them from a distance, are cheap and plentiful. Poultry are exceedingly scarce in the neighbourhood of Bishnath, where, from some local peculiarity, they are subject to an epidemic disease which carries them suddenly off and in great numbers, elsewhere this is not found to be the case.

Local peculiarity of Bishnath, where Poultry are liable to a fatal epidemic.

Fish, when procurable, the different kinds held in most estimation.

In the cold weather fish are very plentiful and cheap, in the rains scarce; those held in most estimation are the rooie, mirga, cutla and pufta.

Wild animals common in the country.

Of wild animals Assam contains many more than its due share,—the most formidable are elephants, rhinoceroses, buffaloes, tigers, bears, leopards and hogs,—the smaller game worthy of notice are deer, hares, florikan, jungle fowl, partridges, snipe, and every variety of wild fowl.

Assam elephants undervalued,—the

The Assam elephant is generally supposed to be less hardy than those of Chittagong, from

many of them having died when newly caught and exported from the country; this prejudice against them will wear off as they become better known; in point of courage they cannot be surpassed, in appearance perhaps they are not so handsome as those brought from Chittagong, having in general smaller heads and a blown out appearance about the belly, solely attributable to the nature of the food they feed on. The usual mode of keeping them adopted by the natives is, to tie their fore-legs and leave them in the jungle during the night to partake of whatever most suits their taste.

reasons why—their good qualities and usual price.

The price of a good sporting one now varies from 3 to 500 rupees, the same animal, when newly caught, may be had for about 120 rupees, —it is considered past all danger when it has survived its capture three years,—a great majority of those which die, do so within the first six months,—great damage is committed on the crops, as may be easily conceived when visited by herds amounting to two and three hundred of them.

Tigers are very numerous, and in the wilder parts of the country where cattle are scarce, kill many of the people,—the average annual casualties by them and buffaloes in a single district, varies from 50 to 80 and 100,—many of those wounded also recover after sustaining wonderful injuries.

Tigers, numerous casualties caused by them.

The only mineral productions I am aware of as existing in the country are gold, copper, iron, lime and coal.

Mineral productions.

Gold.

Gold is found in much less quantity than is generally supposed, few people now make a livelihood by washing for it, which is the more remarkable as no extra revenue is now exacted from them as in former times, when they paid thrice as much as their neighbours, besides being robbed of the fruits of their labour by the Raja and people immediately over them, which would not now be the case.

In former days no doubt it was very plentiful, when large numbers of people were forcibly employed by the Raja and rich nobles in search of it; but now no coercion being allowed, and the people having a very great aversion to hard work, which gold washing is, never think of having recourse to it, excepting when driven to it by necessity.

The Singphos and other hill tribes bring it down to Suddra in small quantities—that now found in the bazars is the produce of former years—the remains of what escaped the ravages of the Burmese, who desolated the country previous to its falling under British rule in the year 1824.

Copper.

Native copper I have never seen, but it is brought down occasionally by the Abbas, who are such troublesome people to deal with, that their visits to the plains are not much encouraged.

Iron.

Iron is found and worked in Upper Assam, its quality is soft, but very good—it is usually

sold in the bazar ready made up in the shape of a native spade used as a hoe.

Limestone.

The only shape limestone has hitherto been discovered in has already been mentioned, found as small round and oval stones washed down from the mountains.

Coal.

Coal has been found at the bottom of the Naga Hills near Rungpore, on the banks of a small river, full of rocks and water-falls, which makes its transport exceedingly difficult. 1000 maunds were once dug out in the year 1828, half the canoes employed were swamped on their return with it, and the Gentleman who superintended the operations and all the workmen employed, suffered more or less from attacks of fever and ague.

State of Agriculture, roads and ordinary modes of carrying produce to market.

Agriculture is carried on in precisely the same slovenly manner and perhaps more so than in Bengal, no improvement in this respect having been adopted for centuries; with the exception of ploughing, the remainder of the work is left almost entirely in the hands of the women.

Wheel carriages are no where in use excepting under the direction of Europeans, and although their usefulness is apparent to all who behold them, there is no appearance yet of their adoption by the natives, who have been so long accustomed to carry the produce of their farms, either on their heads or in baskets with a pole over the shoulder, and by water in canoes;

that they are not likely to be generally adopted until the state of the roads throughout the country is improved. The roads in the neighbourhood of the several Stations are all excellent, but in the country are mere foot-paths, and the old grand bund roads are, in many parts, either much broken or over-run with jungle, neither would the expense and trouble of putting them in order, be rewarded by any corresponding benefit until the population and general trafic of the country greatly increase beyond what they now are.

Country so intersected with nullahs and swamps, generality of roads not available throughout the year.

The country is so intersected with nullahs and swamps that, for six months of the year, the chief communication between distant parts must always be by water, for which purpose the country canoe is admirably calculated.

State of the useful arts, their backwardness.

The useful arts, as might be imagined, are in rather a backward state. Gold and silversmith's work looks very well at a distance, but cannot bear close inspection; the same may be said of the labours of the workers in ivory, in wood, iron and brass; the workmanship is somewhat of the roughest, but good enough for the purposes required. All artizans whose pay is better than that of common coolies, are invariably dissipated characters, constantly under the influence of opium, and if left to themselves would dose away three-fourths of their time, and work out the remainder with very bad grace.

Principal castes, with their common employments.

"The Assamese tribes may be enumerated "as Brahmens, Koleetahs, Quoits, Jogees,

" Dooms, Koomars, Heerahs, Rochs, all profess-
" ing some corruption of the Braminical faith.
" The Robuhs and Cacharies are distinguished,
" more especially the latter, by their strength
" and industry,—they are supposed to be des-
" cended from hill tribes, are fond of good living
" and somewhat given to excess. Besides those
" just enumerated, there are several less im-
" portant sub-divisions—all are husbandmen, but
" the Jogees also wean and breed silk worms;
" the Dooms are fishers, and Koomars fashion
" earthen vessels.

" The highest class, the Ahum, to which the
" Royal family and all the old nobility belong,
" are the descendants of the conquerors of As-
" sam in the 14th century, who came from
" the Eastern country bordering on China,
" they form a limited class and profess Hin-
" dooism."*

General character of the Assamese.

The descendants of the Mussleman invaders during the reign of Aurungzebe, are termed Goorealis, they profess Islamism; tailors and shop-keepers generally belong to this class.

The character of the upper ranks generally is, I fear, not so good as it ought to be; they oppress all under them excepting their own domestic slaves, to whom they usually are very kind; they are not as yet such adepts at intrigue and cunning as Bengallee Aumlah, but are making rapid progress in these acquire-

* Dr. Leslie's Medical Topography of Gohatti.

ments: few of the present race of Ahums can read or write very well, but all the rising generation are perfecting themselves in these accomplishments. In point of morality the upper class shew a deplorable example which the lower orders do not fail to imitate. In no other country that I am aware of, do the women take the same active lead in dissipation; they are as much addicted to the abuse of opium as the men, and in all cases where Bengalees and Hindoostanees associate with them, they never fail to be initiated into the practice.

Their great immorality.

Obscenity of their songs and dances during the Hoolee.

The obscenity of the songs and dancing during the Hoolee, requires to be heard and seen to be believed.

Former warlike character not now applicable to them.

In ancient times the Assamese were considered a warlike race, but at present it is doubtful if their martial ardor excels that of the Bengalees; yet this does not altogether arise from want of personal courage, as I have seen them in many instances attack tigers, buffaloes and other wild animals in such an open and fearless manner, that few Europeans would choose to follow their example.

Their qualification as house servants.

The boys of the country make excellent household servants until they reach the age of 18 —the natural depravity of their natures then breaks forth, and they find it difficult to support themselves on 4 rupees a month; should the luckless master consent to give more, the work is then done by deputy, a younger brother or acquaintance performs it in reality, while the

other would wish to sleep all day after his debauches at night.

Hindoostanee servants dislike the country at first, afterwards never wish to leave it.

Good Hindoostanee servants object to come to or remain in the country, but after a year's residence they are loath to leave it, and sooner or later become as lazy as the Assamese themselves.

Appearance of the upper classes.

The upper classes are fair and good looking when not disfigured by the effects of dissipation; the women too are very handsome, but the better class are kept much out of sight.

Poligamy generally practised.

Poligamy is practised in all cases when it can be afforded; and in many instances when it cannot. The proportion of females to males appears to a casual observer to be as three to two, although in reality they must be nearly equal; the number of children in a family is usually from 4 to 8, but on this subject, as well as on the interesting ones of revenue prospects, the diminished prevalence of crime, and the improvements now in progress for encreasing the resources of the country, full and ample information from authentic documents are constantly given in by the proper local authorities.

Correct information on the state of crime, improving resources of the country, &c. given in by the local authorities not here alluded to.

Longevity; the probable cause of its being so rare.

The Assamese generally speaking do not attain a great age, few old men of 60 and 70 years are to be seen, the shortness of life is as much attributable to early dissipation as to the effects of climate, and taking both together into consideration, it is really surprising they live so long as they do.

Diseases.

The prevailing diseases of the country are fevers, bowel complaints, cholera, small-pox, verminous diseases, scurvy, ulcers, venereal and cutaneous complaints, rheumatism, enlargements of the spleen, goitres, elephantiasis and leprosy.

Fever.

When contracted in cantonments often slight.

Fevers among the natives and sepoys are exceedingly common between the months of June and October, those contracted in cantonments are often very slight; the exhibition of a single emetic or purgative with abstinence from food is sufficient to effect a cure, and many of the inhabitants of the bazar recover without taking any medicine at all.

When contracted near the hills invariably of a dangerous nature.

Far different however are those malignant remittent fevers contracted in the neighbourhood of the hills or in jungly parts of the country, or where the patient has been exposed to privations and fatigue without medical advice at the commencement of his illness; they are attended from the beginning with great prostration of the vital power and local congestions, especially in the head and stomach, causing either common delirium or great irritability of the latter organ: a very large proportion of these cases prove fatal. Such as recover generally require change of air, either to enable them to regain their strength or get rid of an obstinate ague in which it often terminates.

Treatment.

Mercurial purgatives and local depletions by leeches at the commencement of the disease, followed up with counter-irritants and tonics,

were the most successful means of cure had recourse to.

Continued fever is of extremely rare occurrence, generally passing speedily into a remittent type remittents become intermittents, and quotidians pass into tertians—tertians into quartans, and vice versa, although not so frequently.

Continued fevers soon assume the remittent type.

Quotidians are by much the most numerous and easy of cure, and next to them tertians—quartans, though not unfrequent, are of rarer occurrence as a primary affection—and it is astonishing the length of time patients labour under them without suffering much in appearance, loss of flesh, or otherwise; a change of air alone in many cases effects a cure after all medicines have failed. The beneficial effects of the change are generally immediately experienced by Up-country sepoys after passing Bugwaghat near Rungpore. While such is the gratifying result observable in their cases, the very opposite effect is experienced by natives of Assam or even Bengalees assimilated to the climate; in leaving the province they seldom escape attacks of fever or dysentery which often prove fatal. Hence the aversion of the people to leave their country.

Change of air effects cure when all Medical means fail.

Favorable change often apparent immediately on quitting the province.

Agues in general readily yield to the usual means of treatment when seen early, but it unfortunately happens this is not always practicable, and when complicated as old cases always are with enlargements of the spleen, dropsical effusions, diarrhæa, dysentery, or pain-

Agues when early seen usually prove tractable.

ful affections in the bones and joints, the cure is tedious and but too often hopeless, especially at the commencement of the cold weather, when they are carried off in great numbers by dysentery.

It is no uncommon occurrence for agues ushered in with great severity, not to be succeeded by a second attack, or by a very mild one; while on the other hand some of the most harassing cases commence very insiduously, proving obstinate in the extreme.

A few days hot weather, after a short continuance of rain, never fails to produce numerous cases of fever.

Blood-letting in ague, not a favorite, though often a successful, remedy with natives.

Blood-letting in the cold stage was frequently practised in strong subjects with almost always very good success—but it is not a remedy natives are fond of submitting to under these circumstances—even some who had benefitted so much by it, preferred in subsequent illnesses, deferring it until other remedies were first tried.

Dysentery the most fatal of all diseases.

Dysentery is the disease that carries off more victims than almost all the others put together; as an acute affection in an otherwise healthy subject, it is not more fatal than elsewhere, and very few sepoys thus affected die of it—but in men of broken-down constitution, from dissipation, or other complaints, chronic and scorbutic dysentery almost invariably carries them off—especially towards the commencement of the cold weather—indeed every disease of long con-

tinuance has a tendency to terminate in this manner.

Causes for its prevalence, and why so fatal.

As in other countries the poorest and lower orders of the people are the chief sufferers, the deficiency of food and clothes, the bad quality of the food—such as stale fish, cold and indigestible fruits and vegetables—in many places bad water from the neighbouring puddle, the want of the accustomed stimulus of opium which nearly all take when they can get it, the very sudden changes of weather and wearing wet clothes account for the prevalence of the disease and for its great mortality. Such as rally and recover under even these circumstances often fall victims to relapses brought on by their own carelessness and total disregard of all warning and advice.

Opium eaters the greatest sufferers, the greatest mortality occurs among them.

Opium-eaters are much more liable to the disease than those who do not partake of it, and a much larger proportion of them die. The truth being that, in order to procure the drug, they often sell every thing they possess, and poverty alone, from its depressing influence over both mind and body, renders them liable to all diseases arising from debility. Hence the chief mortality in the jails takes place among the poorer prisoners. Men confined from 6 to 12 months for petty thefts—whose constitutions from this cause are already in many instances previously undermined—while the stouter men, such as Dakoits, imprisoned from 3 to 14 years, escape with comparative impunity, and indeed grow fat on their prison fare, which in many

cases is better than they were ever before accustomed to.

The propriety of serving out opium to prisoners, advocated by some as a prophylactic measure, objected to.

Some philanthropists urge the propriety of regularly serving out to the weakly prisoners an allowance of opium, as well as to keep them in health, as with a view to expedite their cure when ill, or convalescent—but if such be ever allowed in Assam, it will hold out such an inducement to crime, and rogues will fare so much better than honester men, that I should dread its speedily filling all the district jails, and eventually incurring great additional expense to Government.

In cases where illness was fairly attributable to this cause, and they are of very frequent occurrence, opium was invariably given in combination with other ingredients, which did not however give the same satisfaction to the patients, who, while calling out for Kanee, their own preparation of it, were not aware they were daily swallowing very considerable quantities of the drug.

The probable good effects that result from distributing an allowance of goor and lime juice in the Jails.

As there is a scorbutic diathesis very prevalent in most of the jails, a small and regular allowance of lime juice and molasses, both produced in the country and cheap articles, if served out would materially tend to benefit the health of the prisoners generally, and never as in the other case prove the slightest temptation for individuals voluntarily to get themselves committed.

Local depletion by leeches, occasional mild laxatives, ipecacuanha with bitters, and in the later stages astringents, aromatics and opiates were the means employed, which afforded most relief. Treatment of Dysentery.

Occasional cases of cholera occur annually, and on an average it appears epidemically every fourth year; thus in 1825 it raged with uncommon mortality among the troops, then on service re-taking the country from the Burmese. Again in 1829 many thousands of the inhabitants in all parts of the country were carried off by it, and it re-appeared with considerable virulence in 1833 and 1835, but not to an equal extent as during either of the former epidemics. Cholera rages epidemically on an average every fourth year.

When this scourge visits the country several circumstances contribute greatly to encrease the mortality attending it. The fatigue and want of rest endured by the inhabitants consequent on their assembling in numbers, and sitting up for many nights in succession singing, beating drums and cymbals, &c. by way of pooja to avert the calamity, no doubt frequently induces it. Causes producing an encrease of cases and of mortality.

Also the loss of time allowed to elapse in their vain attempts to effect a cure, and in applying for medicines even when within their reach, and the inhuman practice, that is but too common, of thrusting the patient out of doors long before all hope of recovery is over, to prevent the possibility of his dying inside the house, by which means it would be defiled.

Such as have friends are pretty carefully looked after, and are only removed when all hopes of amendment are gone, but when the sufferer is not with his own family, he is speedily put outside, left to himself accommodated with a plentiful supply of water, of which he drinks immoderately—few under these circumstances can be expected ever to survive.

Epidemic cholera has hitherto always come from the west, and has never raged epidemically at Suddra.

It has been remarked, that epidemic cholera always comes from the west, and the probable date of arrival at Bishnath after being first heard of at Gowalpara, the frontier station of Bengal, distant about 200 miles, is from a month to five weeks, and from Gowahatti, 120 miles off, from fourteen to twenty days, proceeding upwards to Jorehauth at the same rate—spreading more rapidly along the banks of the river than towards the interior.

In none of the epidemics did their influence extend to more than 50 miles above Jorehauth, having apparently exhausted itself in the boundless tracts of almost uninhabited jungle that intervene between it and Suddra, the frontier station. The correctness of these remarks I have seen thrice verified during the epidemics of 1829, 1833 and 1835.

Small-pox raged in 1832.

Many of the inhabitants shew marks of having had small-pox—but I never saw a case of it in a ten years' residence in the province, excepting in 1832, when it raged with uncommon virulence from February to end of July. The mortality caused by it throughout the

country was very considerable, and ten out of thirty-two cases in the Regimental Hospital proved fatal.

Of these thirty-two cases eighteen were attacked with the simple form, though many of them had severe fever and a copious eruption, all sooner or later completely recovered. Of five cases of the confluent small-pox, one died and four recovered, they were all reduced to a very low state, but eventually did well after being detained in hospital many days; in several ulcers formed which bled largely—and notwithstanding the greatest attention to cleanliness —maggots were produced in these ulcers in great numbers.

Anomalous and fatal variety more resembling measles than small-pox described.

The remaining nine casualties were caused by an anomalous variety, more resembling measles than small-pox. These cases were attended from the beginning with severe fever and tendency to coma. The face in all of them was much swollen. There was a copious discharge from the nose and eyes—and of viscid saliva from the mouth, ejected with great difficulty—there was great oppression of the chest—burning sensation of the stomach and pain in the back and loins—the eruptions never proceeded further than small elevated dots similar to musquito bites—the tongue was enormously swollen and deglutition towards the close of the disease became impracticable, death took place between the fifth and eighth day—not one recovery occurred among any thus affected—to a casual observer their general appearance was less

loathsome than many of those labouring under the simple variety.

Treatment; its total want of success.

The same treatment that succeeded so well in the other cases—free purging and exhibition of mineral acids at the commencement, and tonics afterwards, had not the slightest mitigating effect in checking the disease, neither in subsequent cases had bleeding and applications of blisters any better result. In like cases among the natives, when little or nothing was done, the complaint went through a precisely similar course towards a fatal termination.

Inoculation practised chiefly by Brahmins and among their own class.

Inoculation is practised by Brahmins, but is almost confined to their own class, among whom the operation is performed without fee; but if practised on others a heavy expense is incurred, which the generality of people, in the absence of immediate danger, are by no means anxious to subject themselves to—and few ever availed themselves of the offer of vaccination made by me, not that they had any particular objection to it—but saw no reason to be in a hurry to comply with what they imagined was granting a favour instead of obtaining a lasting benefit.

Prevalence of verminous diseases.

Verminous diseases are exceedingly common, as might be expected in such a low country, where the inhabitants live almost entirely on a vegetable diet, and when the poorer classes do not every day enjoy the luxury of common salt, susbtituting for it a substance they call khar, an impure carbonate of potass procured

from the ashes of burnt plantain tree—even the better classes use it occasionally along with salt, affirming it promotes digestion and partly destroys the effluvia of tainted meat and fish, which they contrive to eat in a horrid state of putrefaction

The salt sold usually in the bazar contains one-third of river sand, even honest dealers acknowledge their being unable to sell the pure ingredient at a small advance in price. Lumbrici are the species of worms most commonly met with. I have seen as many as 25 ejected from the stomach by one emetic, and have heard of 40 and 50 being passed by stool after an active purgative. Lumbrici crawling out of the mouths of children when asleep, is quite a common occurrence. Ascarides are less frequent, but sometimes met with.

Scorbutus is frequently seen chiefly among the lower classes arising from deficiency of nutritious food — exposure to wet and cold, &c. associated with dysentery, which it frequently is, it proves fatal to great numbers.

Scorbutus, the classes whom it chiefly affects.

Tall up-country sepoys who have been accustomed to live on attah, after a few years' residence in Assam, are prone to this complaint, and soon become next to useless as campaigners in the jungle ; while they complain that rice does not afford them sufficient nourishment, they at the same time confess they can only indulge in their favourite food attah twice or thrice a week,

from its causing a sensation of heat, indigestion, and sometimes diarrhœa.

Cutaneous affections.

The same causes that produce scurvy, render cutaneous affections extremely common, the natives of the country seldom apply for medicines on this account, but sepoys often suffer great inconvenience from them when pustular eruptions break out about their loins and inside of the thighs, preventing their wearing their clothes and accoutrements.

Under a short course of purgatives and external applications, containing sulphur and borax, they disappear in a few days, but frequently return after a longer or shorter period.

Ulcers common in the jails, less so among the Troops.

Small ulcers in the legs are commonly met with in the jails during the rains; they sometimes speedily heal up and break out in another part; their usual commencement is as a small boil, the persons so affected are often otherwise out of health, and as it improves, and the cold weather sets in, the sores heal up; they do not often degenerate into large ulcers. Jail patients with this complaint, require to be narrowly watched, as nothing is more common than for them to apply irritating substances to the sores, preferring the rest and quiet in hospital to healthful exercise on the roads.

Treatment.

The moderate use of laxatives, tonics, and nitric acid internally—and stimulating local applications seemed to be the readiest mode of cure.

Sepoys are not much troubled with these small ulcers, but suffer a good deal during the rains from ulcerations between the toes which often cause considerable pain, swelling and constitutional derangement, portions of the thick skin from the soles of the feet come away, and the patient may be unable to walk for a fortnight or three weeks, poultices are often necessary at the commencement to allay pain, and afterwards absorbent powders, burnt alum—balsam of Peru is an excellent application in all such instances. In slight cases and healthy subjects, rest and attention to cleanliness soon effects a cure.

Ulcerations between the toes, a troublesome complaint, sepoys more liable to it than natives.

The Assamese are not often attacked in this manner.

Sympathetic buboes in the groin and armpits are also common, and often suppurate from not being seen in time—it is difficult to account for their great frequency, as they are often met with among the young and vigorous as with those bearing marks of a scrofulous habit.

Sympathetic bubos very common and difficult to be accounted for.

When seen early, they quickly disappear under the use of leeches and cold lotions, but in many cases they have proceeded too far towards a state of suppuration to prevent its taking place. Now and then they assume an indolent state, requiring the use of blisters and mercurial frictions. The natives of the country are less liable than sepoys to this complaint.

Venereal complaints and gonorrhœa are prevalent at all the stations—the natives say the

Venereal complaints and gonorrhœa.

former first became common soon after the Burmese invasion in 1818, and the name they gave it (Maunghao,) Burmese sore, seems to confirm the truth of their assertion; the most lamentable cases of secondary syphilis may be constantly seen, and the wretches labouring under it have seldom patience to undergo a proper course of medicine, although in many cases they have been furnished for this purpose with food, clothes, and lodgings by charitable friends.

In the Regimental Hospital a gentle alterative course, with sarsaparilla in these cases, was always gone through.

From the relaxing effects of climate the cure of gonorrhœa is extremely difficult—the most trifling errors in diet, riding on horse-back or on elephant, are sufficient to cause a relapse after a fortnight or three weeks apparent cure; this tendency is less apparent in the cold weather, when such cases do well.

Rheumatism, its chief peculiarity, its intractability seldom yielding to any thing but change of climate.

Obstinate rheumatism, though a rare complaint with the natives, is by no means so among the sepoys and other foreigners living in their country. It frequently follows attacks of fever, venereal, and from the effects of cold—its chief peculiarity is its remarkable obstinacy, seldom yielding to any mode of treatment from whatever causes it may have arisen—patients who have for months undergone every variety of means for effecting a cure with but partial benefit, always recover by change of air for a few months.

Enlargements of the spleen, consequent on old agues, are very common—a great many people labouring under this affection enjoy tolerable health, and only complain of it when attacked with fever, when it enlarges and becomes painful; many children under these circumstances recover astonishingly soon without any medicine whatever, when taken into service, and are well fed and clothed

Enlargements of the spleen often little complained of.

The tonic and purgative mode of treatment succeeds very well, but vinegar is the article of all others which natives covet in such cases as a perfect specific.

Cases of goitre, elephantiasis and leprosy are met with in all parts of the country, but not so frequently as might be expected, excepting at Suddra, where goitre certainly is remarkably prevalent.

Goitre, elephantiasis and leprosy not so often seen as might be expected.

In Assam the Medical art is at a very low ebb; there are a few Native physicians who are so perfectly satisfied with their own proficiency, that they never seek European assistance under any circumstances.

State of the medical art in Assam among the natives.

In answer to the question of how they treat their patients, the invariable reply is—"We give preparations of gold and silver with many jungle herbs besides"—luckily for the patients, no part of the gold or silver ever reaches their stomachs.

As all complaints are attributable more or less to witchcraft, the primary indication is to dispel that, and different forms of pooja and penance are the modes pursued with this view.

Although the Doctors keep their system of practice secret, if they have one—yet in a country where sickness is so prevalent for six months of the year, every old woman pretends to the knowledge of being able to cure the more common complaints, which are treated in the following manner.

Native treatment of common diseases. Fevers.

In fevers, abstinence from all food, thirst allayed by milk and water, sweetened with goor and seasoned with ginger—cold applications to the head, (generally some mashed vegetable substance,) when symptoms of recovery begin to shew, a little rice and dhall are allowed, but fish and vegetables are forbid until convalescence is completed.

Dysentery and cholera.

In dysentery and cholera opium is their chief resource, and black pepper is given in considerable quantity made into pills with certain jungle leaves—cold applications are also applied to head and stomach in cholera.

Small-pox.

In small-pox, the patient is judiciously kept in the coolest place procurable—great care is taken that he sees no one dressed in any colored clothes, every thing must be white; what little jewellery there may be in the family is also spread out on a cloth before the invalid. All

the wild tribes in the neighbourhood immediately desert those affected to their fate and do not return until all cause for alarm has passed.

Worms.

In worms, the natives are aware of the good effects of pomegranate bark which is used by them for their expulsion—they also say a decoction of the roots of the common chopper grass produces similar good effects.

Wonderful recoveries often take place after apparently fatal injuries.

In surgery, nature works wonders—some of the recoveries after injuries by buffaloes and tigers are astonishing—under similar circumstances no European could have survived. Rest—a little laxative medicine, keeping the wounded parts clean, and in position, were all that was usually necessary—bruises and smaller injuries are immediately smeared with lime, which all carry about with them in their farm boxes—it serves the triple purpose of easing pain and heat, and of making a great display in the event of their having a complaint to make.

Conclusion—recommending that 15 years Assam servitude should be allowed to count with natives as 20 elsewhere.

Should subsequent experience confirm the truth of the remarks now made on the nature of the climate, and the numerous occasions occurring in which it is absolutely necessary for troops to be exposed to its noxious influence, by which their constitutions suffer irreparable injury, be kept in mind, perhaps the claims of sepoys physically unfit for further service, who have served 15 years in Assam (most certainly equivalent to 20 anywhere else) might meet with the favourable consideration of Government if

the hardship of their case was fairly brought to its notice.

As this boon might only be extended to those whose complaints were contracted in the country, and whose incapacity for further service is solely attributable to the effects of its climate, the indulgence would be thankfully received by them and be attended with a very trifling expense to the State.

BISHNATH, ASSAM,
31*st October*, 1837.

FINIS.

Printed by G. H. Huttmann, Bengal Military Orphan Press.

Due Date

26 JUN 1964

V + R (?)

Digitized with financial assistance from the
Government of Maharashtra
on 20 February, 2016